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ROYAL AIRCRAFT ESTABLISHMENT
TECHNICAL REPORT 69267

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SUBSONIC WIND-TUNNEL TESTS
ON A SERIES OF BOMBLETS
WITH CANTED FINs [R]

by

D. L. I. Kirkpatrick

P. L. Appleton Jones

SCIENTIFIC AND TECHNICAL INFORMATION BRANCH
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December 1969

SUBSONIC WIND-TUNNEL TESTS ON A SERIES OF BOMBLETS WITH CANTED FINs

by

D. L. I. Kirkpatrick

P. L. Appleton Jones

SUMMARY

This Report describes wind-tunnel tests to measure the aerodynamic characteristics of a series of 48 bomblets with planar, canted and curved cruciform rectangular fins. Analysis of the results shows how the force and moment characteristics of a bomblet are affected by its length, its nose shape and the size and cant angle of its fins.

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1 INTRODUCTION

One requirement of a cluster weapon is that, for certain targets, it should be capable of dispersing its bomblets in a pattern covering a large area of ground. One method of obtaining a suitable pattern is to eject the bomblets from their parent container, but with this method pattern sizes are limited by the ejection force available and the forces required for large patterns are difficult to achieve in practice.

This difficulty can be avoided by using bomblets which are self-dispersing because of their aerodynamic characteristics. Several such bomblets are considered in Ref.1 and a brief theoretical study of possible ground pattern sizes for the canted fin bomblet (see Fig.1a) has been presented in Ref.2. The aerodynamic characteristics of this bomblet configuration were defined in terms of the normal force, drag and rolling moment coefficients, obtained from the data in Refs.3 and 4, and it was found, ignoring the effects of lateral forces and initial disturbances, that satisfactory ground patterns could be obtained.

Having thus shown that bomblets with canted fins could yield satisfactory ground patterns, it was decided to measure the aerodynamic characteristics of some representative bomblet shapes in a low-speed wind-tunnel in order to provide data for a more detailed study of bomblet motions. This Report describes the wind-tunnel tests and presents an analysis of the experimental results.

2 EXPERIMENTAL EQUIPMENT AND PROCEDURE

2.1 Bomblets

Fig.2 shows the 2 bodies, 2 noses and 11 tails which combined to form the different configurations, 4 of which had no fins. Fig.3 shows some of these bomblet configurations mounted in the wind-tunnel.

Each of the two wooden cylindrical bodies was combined with the ogival nose, whose radius of curvature equalled the body diameter, or with the bluff nose to make the four bomblets listed below:

Overall length/diameter ratio	5	3	5	3
Nose shape	bluff	bluff	ogival	ogival

Each of the bomblets was tested with each of the tails shown in Fig.1b; it should be noted that curved fin configurations B and C include the same tail (shown in Fig.2) at different angles of roll. Each tail was made of a hollow metal cylinder which fitted over the rear of the body being tested and fins of

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metal plate 1.5 mm (0.06 in) thick which were welded to the cylinder in mutually perpendicular planes. All the fins had the same chord which was equal to $\frac{3}{4}$ of the body diameter.

The tails tested (Figs.1b and 2) consisted of:

(a) A set of 4 tails with straight cruciform fins of gross span 2.5 (body diameter). One pair of opposite fins was canted at 0, 2.5, 5 and 10 deg to the axial line.

(b) A set of 4 similar tails with fins whose gross span was 1.5 (body diameter).

(c) A set of 2 tails with uncanted, curved cruciform fins which yielded 3 fin configurations. Each of these fins had a radius of curvature equal to half the body diameter and a surface area equal to one of the fins in set (a). The span of one of the curved fin tails was 2.364 (body diameter) and the tips and roots of each pair of fins were coplanar.

(d) A tail with no fins. The results obtained with this tail were used as a datum when calculating the effect of fins on bomblet performance.

2.2 Force-measuring equipment

The design of the six-component strain-gauge balance used in this experiment was similar to those used in the 8 ft by 6 ft transonic wind-tunnel at R.A.E., Farnborough. In the design the strength and sensitivity of the balance were determined by the expected magnitude of the aerodynamic forces and moments on the bomblet; these forces and moments were estimated using an empirical method presented by Brebner in Ref.5.

The balance was machined from a solid steel bar and 12 matched pairs of Constantan foil gauges were used to form the bridges to measure the three forces and three moments on the balance. Calibration showed that the relations between the balance readings and the applied forces and moments were linear over the expected range and that the first-order interactions were small.

The signals from the six strain-gauges bridges were measured by automatic self-balancing units⁶ and the results were punched on to ICL computer cards.

2.3 Experimental procedure

Each of the 48 bomblet configurations was mounted on the support rig⁷ in the 4 ft by 3 ft low-turbulence wind-tunnel at R.A.E., Farnborough. The aerodynamic forces and moments on the bomblet were measured at angles of pitch, θ , spaced at 5 degree intervals from -10 to +25 deg and also at 28 or 29 deg, and at angles of roll, ϕ , spaced at 22.5 deg intervals from 0 to 90 deg. The tests were made at a wind speed of 73 m/sec (240 ft/sec), this being the maximum speed which the wind-tunnel could attain with a bomblet mounted at a large angle of pitch. No attempt was made to influence the transition of the boundary layer on the bomblet since the Reynolds number of a bomblet in flight is expected to be of the same order as that in the wind-tunnel. In the wind-tunnel tests the Reynolds number based on body diameter was equal to 3.84×10^5 .

Fig.3 shows that, in the tests using the shorter body, part of the strain-gauge balance protruded from the rear of the bomblet. Since the diameter of that part of the balance was only half that of the body and was always immersed in a region of stalled flow, it was considered that the effect of the balance on the bomblet characteristics and the effect of the wake flow on the balance measurements would be small, and certainly not large enough to justify the design and manufacture of a specially-short six-component balance for this bomblet configuration.

3 CALCULATION OF RESULTS

The measured results were processed by the DEUCE computer at R.A.E., Bedford which calculated the measured forces and moments using the balance calibration matrix and non-dimensionalised them with respect to qS and qSd respectively, where q is the free stream dynamic pressure, d is the diameter of the bomblet and $S = \pi d^2/4$ is its cross-sectional area. The computer programme⁸ yielded the corrected angles of pitch and roll, the force and moment coefficients C_X , C_Y , C_Z , C_ℓ , C_m and C_n in and about rotating body axes (see Fig.4), the lift and drag coefficients C_L and C_D which act in the XZ plane normal to and along the free stream direction and the angles of incidence and sideslip as defined by Kettle⁸. The corrections which should be applied to the force and moment coefficients to allow for the effect of the presence of the wind-tunnel walls were calculated using conventional methods⁹ and were found to be negligibly small. The nominal values of the support rig pitch and roll angles, θ and ϕ , set during the tests were corrected for the deflection

under load of the sting and balance; these corrections were calculated from the measured forces and moments and the balance deflection characteristics obtained during the calibration.

For convenience of analysis (see section 4.3.1) the computed results were then processed by the ICL 1907 computer at R.A.E., Farnborough which calculated the values of the aerodynamic forces and moments in and about non-rotating body axes, i.e. the values of C_X , \bar{C}_Y , \bar{C}_Z , C_ℓ , \bar{C}_m and \bar{C}_n (see Fig.4). These forces and moments are presented in the tables.

When the results had been calculated it became apparent that, because of the relative size of the yawing and rolling moments, there was appreciable interaction between these two components. When the yawing moment was large, the value of the rolling moment was obtained as the small difference between two large numbers. Consequently only those values of rolling moment which were calculated when the yawing moment was negligible, i.e. when θ or ϕ equals zero, should be accepted as reliable.

During the experiment it was observed that when bomblets with large fins were set at large angles of pitch, $\theta > 15$ deg, and at moderate angles of roll, $22.5 \text{ deg} \leq \phi \leq 67.5 \text{ deg}$, the strain-gauge balance readings fluctuated considerably, probably due to unsteady interactions between the fins and the vortices shed from the body. While the measured value of any component was generally taken at a reasonably mean of the fluctuating reading, the results obtained in such conditions must be accepted only with reservations.

In the cases when the zero drift of the strain-gauge balance readings was appreciable (see tables) it was assumed when calculating the results that the zero drift varied linearly with time.

4 DISCUSSION AND ANALYSIS

4.1 Preface

During the tests described above, the aerodynamic forces and moments on each of 48 bomblet configurations were measured with the bomblet set at 45 different combinations of the pitch angle θ and the roll angle ϕ , giving a total of over 13000 data points. We believe that the presentation of such a large mass of data would serve to confuse rather than enlighten the reader. Accordingly we have analysed the experimental data and present in this Report only the results of our analysis, together with a few of the measured force and moment characteristics to illustrate the discussion. All the experimental

results are presented in the tables for the benefit of those intending alternative analyses.

For ease of comparison, many of the figures in this Report include data relating to several different body/nose/tail combinations so the chosen system of symbols must be kept firmly in mind when studying the figures. In this system:

- (a) The size and type of the fins is indicated by the colour of the symbols; black, red, green and blue symbols represent bomblets without fins, with small straight fins, with large straight fins and with curved fins respectively.
- (b) The length of the bomblet is indicated by the size of the symbols; large and small symbols represent bomblets whose ℓ/d ratios are 5 and 3 respectively.
- (c) The shape of the bomblet nose is indicated by the shape of the symbols; round and square symbols represent bomblets with ogival and bluff noses respectively.
- (d) Bomblets with straight uncanted fins are represented by symbols containing a dot and those with curved uncanted fins in the A, B and C configurations (see Fig.1b) are represented by symbols containing a /, + and \times respectively.
- (e) Bomblets having one pair of opposite fins set at cant angles of 0, 2.5, 5 and 10 deg are represented by the symbols \emptyset , H, V and X respectively.

For ease of reference, a table of symbols has been printed on a fold-out sheet at the back of this Report.

4.2 Bomblets without fins

The normal force and pitching moment characteristics of the four bomblets without fins were plotted in Fig.5. At low angles of pitch the normal force characteristics are virtually linear and are not significantly affected either by the overall length/diameter ratio of the bomblet or by the shape of its nose. At larger angles, however, the slopes of the normal force characteristics increase with pitch and this increase may be attributed to flow separations from the upper surface of each bomblet, possibly accompanied by the formation of vortices¹⁰. The magnitude of the normal force

increment induced by the flow separation appears to depend on the length and nose shape of the bomblet.

Fig.5 also shows the variation, with the angle of pitch, of the position of the point of action of the normal force on each of these four bomblets. At low angles of pitch the bluff-nosed bomblets are more stable than those with ogival noses but the difference decreases with increasing pitch.

The values of $\partial C_z / \partial \theta$ and X_{cp} / ℓ calculated at $\theta = 5^\circ$ were plotted in Fig.6 and compared with the results of earlier tests^{11,12} and with the empirical performance curves presented by Hills³. The present results are in close agreement with those obtained previously. When using these results to estimate the performance of other bomblets, it must be remembered that the position of the centre of pressure of a short bluff-nosed bomblet is significantly affected¹¹ by the value of the nose corner radius/body diameter ratio. This ratio was approximately equal to 0.005 for the bluff nose used in this experiment.

The axial force coefficients of the bomblets without fins were plotted against the angle of pitch in Fig.11; at $\theta = 0$ the values of C_X are very close to those predicted empirically by Hoerner¹³. At zero pitch the values of C_X for the long bomblets are slightly smaller, numerically, than those for the short bomblets whose fineness ratio (ℓ/d) is small. As the modulus of the pitch angle $|\theta|$ increases from zero the value of C_X becomes larger, as in other tests¹¹, by an amount which is slightly greater for bomblets with bluff noses than for those with ogival noses.

4.3 Bomblets with uncanted fins

4.3.1 Method of analysis

The characteristics of the finned bomblets may conveniently be considered in terms of the parameters (see Fig.4)

$$\bar{C}_Z = C_Z \cos \phi + C_Y \sin \phi \quad ,$$

and

$$\bar{C}_m = C_m \cos \phi - C_n \sin \phi \quad .$$

With the bomblet at a given pitch angle θ and a given roll angle ϕ , the incidences, α_1 and α_2 , of the two pairs of fins in mutually perpendicular planes are given by the expressions

$$\alpha_1 = \tan^{-1} \left(\frac{U \sin \theta \cos \phi}{U \cos \theta} \right) \approx \theta \cos \phi ,$$

and

$$\alpha_2 = \tan^{-1} \left(\frac{U \sin \theta \sin \phi}{U \cos \theta} \right) \approx \theta \sin \phi .$$

The normal force coefficient C_N of each fin is a function of the incidence of that fin and therefore

$$\bar{C}_Z = [\bar{C}_Z]_b - 2 \cos \phi C_N(\alpha_1) - 2 \sin \phi C_N(\alpha_2) ,$$

where the subscript b denotes forces on a bomblet without fins. If the aerodynamic characteristics of each fin were linear and $\partial C_N / \partial \alpha$ was constant then the normal force on each fin would be

$$C_N(\alpha_1) = \frac{\partial C_N}{\partial \alpha} \theta \cos \phi$$

and

$$C_N(\alpha_2) = \frac{\partial C_N}{\partial \alpha} \theta \sin \phi ;$$

so the force \bar{C}_Z on a finned bomblet would be

$$\bar{C}_Z = [\bar{C}_Z]_b - 2[\cos^2 \phi + \sin^2 \phi] \theta \frac{\partial C_N}{\partial \alpha}$$

and \bar{C}_Z , and similarly \bar{C}_m , would be independent of ϕ . To investigate the dependence of $\bar{C}_Z = C_Z \cos \phi + C_Y \sin \phi$ on ϕ , the values of \bar{C}_Z were calculated from the experimental values of C_Z and C_Y which were measured over a range of values of θ and ϕ for all the bomblet configurations tested; some typical sets of results were plotted in Fig.7

Before studying these results, it is useful to discuss briefly the aerodynamic characteristics which may be expected of rectangular low-aspect-ratio fins. The normal force characteristic of such a fin at low incidence should be almost linear but a normal force component, which increases non-linearly with incidence, will probably be induced by the tip vortex resulting from flow separation at the outer edge of the fin. At a moderate incidence, generally about 10 deg, the fin should stall due to flow separation at the leading edge but if the fin aspect ratio is small the stall may be inhibited by the presence of the tip vortex.

The experimental results in Fig.7 show that the value of \bar{C}_Z for the bomblet with small fins increases smoothly with the angle of pitch, suggesting that the small fins do not stall within the range of pitch of this experiment. However the larger fins, either straight or curved, appear to stall when their incidence is about 10 deg and, since the angle of pitch θ at which the fin incidence exceeds 10 deg is dependent on roll angle, the value of \bar{C}_Z when $\theta > 10$ deg is appreciably affected by variation of the roll angle ϕ . When the fins are not stalled, i.e. when $\theta < 10$ deg for large fins and $\theta < 25$ deg for small fins, the value of \bar{C}_Z is virtually independent of ϕ because the non-linearity of the fin normal force characteristic and the variation with ϕ of the fin/body interference are small.

To simplify the subsequent analysis of the performance of different fins, it was assumed that \bar{C}_Z was independent of ϕ and equal to the value measured when $\phi = 0$ or $\pi/2$. The effects of ϕ on fin performance, i.e. on the value of $(\Delta\bar{C}_Z)_f = \bar{C}_Z - [C_Z]_b$, are significant only on large fins when they are stalled so, since the incidence of the bomblet fins in steady trimmed flight is unlikely to exceed the stalling incidence, it is reasonable to make the simplifying assumption that \bar{C}_Z is independent of ϕ .

In the preceding paragraphs the parameters

$$\bar{C}_Y = -C_Z \sin \phi + C_Y \cos \phi$$

and

$$\bar{C}_n = C_m \sin \phi + C_n \cos \phi$$

have been ignored. This force and moment are the result of fin/fin and fin/body interference and the test results showed that they are generally very

small, only a few per cent of the corresponding values of \bar{C}_Z and \bar{C}_m . Some typical values of \bar{C}_Y were plotted in Fig.8 which shows that the magnitude of \bar{C}_Y tends to increase with the size of the fins and the angle of pitch and is dependent on the angle of roll ϕ , being largest when $\phi = 22.5$ or 67.5 deg. Since \bar{C}_Y is generally small and is appreciable only in cases, i.e. for long bodies at large angles of pitch, when the measured results are least reliable (see section 3) the parameters \bar{C}_Y and \bar{C}_n will be neglected in the analysis below.

4.3.2 Effect of fins on bomblet characteristics

The effect of fins of different size and shape on the \bar{C}_Z characteristics of the various bomblets was obtained by calculating,

$$(\Delta\bar{C}_Z)_f = \bar{C}_Z - [\bar{C}_Z]_b$$

and plotting the value of $(\Delta\bar{C}_Z)_f$ against the angle of pitch θ . Fig.9 shows that the large fins stall at a pitch angle of about 10 deg but that the small fins do not appear to stall below a pitch angle of 25 deg, though it is possible that at least part of the fin stalls and the effects are obscured by the effects of the tip vortices. The values of the slope $\partial/\partial\theta (\Delta\bar{C}_Z)_f$ at small values of θ were calculated and tabulated below; the table shows that $\partial/\partial\theta (\Delta\bar{C}_Z)_f \approx -1.5 \{(b/d)^2 - 1\}$

Fin	$\frac{b}{d}$	$1.5 \left\{ \left(\frac{b}{d} \right)^2 - 1 \right\}$	$\frac{\partial}{\partial\theta} (\Delta\bar{C}_Z)_f$
Small straight	1.5	1.9	-2.2
Large straight	2.5	7.9	-7.8
Large curved	2.36	6.9	-6.7

At angles of pitch greater than 10 deg the values of $(\Delta\bar{C}_Z)_f$ for the large fins on the bluff-nosed bomblet appear to be higher than the values for the same fins on the ogival-nosed bomblets. But when the flow round the fins was not stalled, the performance of both the large and small fins was independent of bomblet length and nose shape.

The position $(X_{cp}/\ell)_f$ of the centre of pressure of the force $(\Delta\bar{C}_Z)_f$ due to the fins was calculated at various values of θ for each of the bomblet configurations tested. Some of the results were plotted in

Fig.10 which shows that for all the bomblets $(X_{cp}/\ell)_f$ lies quite close to the quarter-chord point of the fins and moves slowly rearward with increasing pitch. For the longer bomblets $(X_{cp}/\ell)_f$ appears to be slightly nearer the leading edge of the fin than $(X_{cp}/\ell)_f$ for the shorter bomblets at the same angle of pitch, but the position of the centre of pressure of the force $(\Delta \bar{C}_Z)_f$ appears to be virtually independent of fin size, fin curvature or bomblet nose shape.

The values of the axial force coefficient C_X were plotted in Fig.11, which shows that adding fins to a bomblet at zero pitch increases the modulus of the axial force on it, i.e. C_X becomes more negative, by an amount which is roughly proportional to the total fin area. As the angle of pitch of each bomblet increased from zero, the modulus of the axial force on it increased at a rate which was dependent on the size of the fins. Some exploratory measurements of the distribution of the static pressure p across the base of some of the bomblets indicated that the presence of the fins had an appreciable effect on the static pressure distribution, especially for bomblets with large fins at large angles of pitch. Thus the effect on the C_X characteristic of a bomblet of adding fins to it can be attributed primarily to the effect of the fins on the bomblet base pressure distribution.

The rolling moment coefficients measured at $\phi = 0$ for the bomblets with large or small straight fins were all very small (see tables). For the bomblets with curved fins however, the results plotted in Fig.12 show that when $\theta > 10$ deg there is an appreciable positive rolling moment on the bomblets fitted with fins A or C, and an equal and opposite rolling moment on those fitted with fin B. The size of the rolling moment, which occurs because the curved fins whose windward side is convex stall at rather lower incidence than those whose windward side is concave, appears not to be significantly affected by the length or nose shape of the bomblet. It should be remembered that the values of the rolling moment coefficient measured at zero roll, $\phi = 0$, are not generally representative of the rolling moment at other angles of roll. Further tests to investigate the effect of roll angle on rolling moment have been made and the results will be presented in a later report.

4.4 Bomblets with canted fins

4.4.1 Method of analysis

The effect of the canted fins on the aerodynamic characteristics of a bomblet must be analysed in a manner different from that outlined in

section 4.3.1 because the cant angle of a pair of fins has an appreciable effect only on the C_Z , C_m and C_X characteristics. It is therefore convenient in this section to ignore the parameters \bar{C}_Z , \bar{C}_m etc. and to consider the effects of the fin cant angle δ in terms of the increments

$$(\Delta C_Z)_\delta = C_Z - (C_Z)_{\delta=0} ,$$

$$(\Delta C_m)_\delta = C_m - (C_m)_{\delta=0}$$

and

$$(\Delta C_X)_\delta = C_X - (C_X)_{\delta=0}$$

since these increments are independent of roll angle when the fin aerodynamic characteristics are linear. For design purposes, the forces on a bomblet with canted fins can be calculated from the expressions

$$C_Z = \{[\bar{C}_Z]_b + (\Delta \bar{C}_Z)_f\} \cos \phi + (\Delta C_Z)_\delta$$

$$C_Y = \{[\bar{C}_Z]_b + (\Delta \bar{C}_Z)_f\} \sin \phi$$

and

$$C_X = [C_X]_b + (\Delta C_X)_f + (\Delta C_X)_\delta .$$

4.4.2 Effect of fin cant on bomblet characteristics

The values of C_Z measured on each bomblet configuration with the fins set at different cant angles were plotted against θ for various values of ϕ , and it was found that $(\Delta C_Z)_\delta$ was virtually independent of θ and ϕ , as shown by the typical sets of results plotted in Figs.13 and 14, provided that the flow round the fins was not stalled. The values of $(\Delta C_Z)_\delta$ at $\theta = 0$ for all the bomblet configurations were plotted in Fig.15 which shows that $(\Delta C_Z)_\delta$ is directly proportional to the cant angle δ and that $\partial/\partial \delta (\Delta C_Z)_\delta$ for the large fins is considerably greater than for the small fins. Figs.13 and 14 show that at $\phi = 0$ the force increment due to the canted fins was equal to zero, i.e. $C_Z = [C_Z]_b$ when the bomblet was set at an angle of pitch θ_0 which is smaller than the fin cant angle δ ; the difference

between δ and θ_0 is caused by fin/body interference. Fig.14 shows no evidence of the small canted fins stalling within the range of pitch of this experiment but Fig.13 suggests that when the magnitude of the angle $(\theta \cos \phi - \theta_0)$ is greater than the stalling angle of the large fins (approximately 10 deg) the canted fins are stalled.

Although the effects of fin cant on the measured normal force and pitching moment characteristics were small, especially for the smaller fins, it was possible to calculate the position of the centre of pressure of the increment $(\Delta C_z)_\delta$ with useful accuracy. For the short body $(X_{cp}/l)_\delta$ was found to equal 0.8 for all bomblet configurations and cant angles; for the long body the calculated values were more scattered and $0.77 < (X_{cp}/l)_\delta < 0.9$. These positions are not very different from the corresponding position of $(X_{cp}/l)_f$ (see Fig.10).

It was expected that the effect $(\Delta C_x)_\delta$ of fin cant on the axial force coefficient when the canted fins were not stalled would be directly proportional to the product of the normal force on the canted fins and the sine of the cant angle, i.e. $(\Delta C_x)_\delta$ would be proportional to $\delta(\theta \cos \phi - \theta_0)$, and that when the canted fins were stalled $(\Delta C_x)_\delta$ would be constant. The values plotted in Fig.16 show that the variations of C_x with cant angle, pitch and roll are similar to the expected variations.

The rolling moment coefficients measured at $\phi = 0$ were not affected by changing the cant angle of the large or the small straight fins, as was expected because of their symmetry.

5 CONCLUDING REMARKS

Analysis of the experimental results presented in this Report has shown how the aerodynamic force and moment characteristics of the bomblets tested were affected by their length, their nose shape and the size and shape of their fins. The force and moment increments due to the bomblet fins were found to be primarily dependent on the size and shape of the fins themselves and were not significantly affected by the length of the bomblet or the shape of its nose. But, because the aerodynamic characteristics of a bomblet without fins were dependent on the length and nose shape of the bomblet, the stability of finned bomblets and the trimmed lift of bomblets with canted fins were appreciably affected by bomblet length and nose shape.

To supplement the results in this Report, further tests to investigate in detail the aerodynamic rolling moment characteristics of finned bomblets have been made and will be presented in a later report.

Tables

The force and moment coefficients tabulated below are in and about non-rotating body axes, as defined in section 3; the pitching and yawing moments are about axes which pass through the point $X/\ell = 0.50$ on the bomblet axis.

Because of the limited versatility of the teleprinter output from the ICL 1907 computer,

\bar{C}_Y is printed as C_Y

\bar{C}_Z is printed as C_Z

C_ℓ is printed as C_L

\bar{C}_m is printed as C_M

\bar{C}_n is printed as C_N

in all the tables below.

Wind tunnel tests on canted fin bomblets - R.A.E. 3ftx4ft tunnel results (Run.2)

RUN NUMBER=2 LONG BODY, ROUND NOSE, LARGE TAIL
 CANT ANGLE= 0.0 DEG. CG POSITION 50.00X
 V= 240, FPS R2= 0.384 MILLION

DP.NO.	ATTITUDE THETA	PHI	CZ	CM	COEFFICIENTS CX	CY	CN	CL
NR 266	-10.09	0.00	1.63	1.938	-0.272	0.043	-0.112	0.008
NR 267	-10.09	21.49	1.61	1.899	-0.252	-0.025	0.087	0.002
NR 268	-10.11	43.00	1.60	1.853	-0.223	0.034	-0.010	0.017
NR 269	-10.13	67.50	1.61	1.824	-0.238	0.116	-0.151	0.030
NR 270	-10.15	90.09	1.62	1.890	-0.259	0.097	-0.069	0.015
NR 273	-5.04	-0.01	0.79	0.804	-0.237	0.015	-0.037	-0.014
NR 274	-5.05	22.69	0.75	0.819	-0.231	-0.022	0.034	-0.002
NR 275	-5.06	44.89	0.70	0.740	-0.231	0.007	0.034	0.008
NR 272	-5.08	67.69	0.70	0.732	-0.231	0.054	-0.019	0.015
NR 271	-5.10	90.08	0.73	0.755	-0.236	0.049	0.012	0.007
NR 276	0.00	-0.01	-0.05	-0.049	-0.246	0.020	-0.024	-0.021
NR 277	0.00	21.49	-0.06	-0.063	-0.243	0.022	-0.008	-0.008
NR 278	-0.01	44.89	-0.08	-0.059	-0.239	-0.003	0.032	0.002
NR 279	-0.03	67.69	-0.09	-0.071	-0.243	0.012	0.046	0.011
NR 280	-0.05	89.99	-0.09	-0.080	-0.248	0.020	0.064	0.012
NR 285	5.05	-0.02	-0.90	-1.010	-0.244	-0.002	-0.040	-0.031
NR 284	5.04	22.68	-0.88	-0.960	-0.243	0.022	-0.020	-0.019
NR 283	5.03	44.88	-0.85	-0.883	-0.242	-0.006	0.038	-0.011
NR 282	5.02	66.68	-0.90	-0.977	-0.248	-0.036	0.182	0.004
NR 281	5.01	89.99	-0.96	-1.104	-0.250	-0.010	0.121	0.010
NR 286	10.09	-0.03	-1.68	-1.977	-0.268	0.008	-0.055	-0.057
NR 287	10.09	22.66	-1.68	-1.933	-0.257	0.042	-0.072	-0.050
NR 288	10.08	44.97	-1.71	-1.931	-0.244	-0.038	0.116	-0.020
NR 289	10.07	67.69	-1.71	-1.988	-0.272	-0.103	0.309	0.009
NR 290	10.05	89.99	-1.75	-2.073	-0.297	-0.060	0.200	0.010
NR 295	15.12	-1.03	-2.07	-2.100	-0.308	-0.023	0.100	-0.046
NR 294	15.12	22.66	-2.11	-2.147	-0.287	-0.072	0.122	-0.059
NR 293	15.13	43.84	-2.46	-2.829	-0.240	-0.075	0.173	-0.068
NR 292	15.10	67.30	-2.18	-2.232	-0.284	-0.014	0.141	0.029
NR 291	15.08	89.99	-2.14	-2.179	-0.323	-0.070	0.205	0.021
NR 296	20.15	-1.03	-2.51	-2.261	-0.318	-0.030	0.104	-0.055
NR 297	20.14	22.66	-2.43	-2.156	-0.313	-0.124	0.239	-0.090
NR 298	20.16	43.83	-2.97	-3.270	-0.298	-0.191	0.380	-0.215
NR 299	20.13	67.56	-2.46	-2.167	-0.342	-0.109	0.304	0.127
NR 300	20.12	89.99	-2.56	-2.324	-0.332	-0.100	0.218	0.013
NR 304	25.18	-1.04	-2.92	-2.264	-0.407	-0.023	0.088	-0.060
NR 303	25.17	22.51	-2.78	-2.095	-0.406	-0.117	0.998	0.023
NR 302	25.15	67.44	-2.82	-2.229	-0.390	0.564	-0.683	-0.076
NR 301	25.15	89.99	-2.93	-2.900	-0.433	-0.111	0.228	0.010
NR 305	29.21	-1.05	-3.46	-2.674	-0.404	-0.014	0.102	-0.078
NR 306	29.19	22.53	-3.12	-2.279	-0.375	-0.583	1.146	0.056
NR 307	29.18	67.40	-3.17	-2.472	-0.375	0.499	-0.973	-0.192
NR 308	29.17	89.99	-3.16	-2.340	-0.421	-0.151	0.285	0.011
NR 304	-0.05	89.99	-0.08	-0.129	-0.243	0.010	0.141	0.021

R=RESULTS IN ROLLING BODY AXES.
 NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E. 3FTx4FT TUNNEL RESULTS.

OP.NO.	ATTITUDE THETA	PHI	CZ	CM	COEFFICIENTS CX	CY	CN	CL
NR 265	0.00	-0.01	-0.05	-0.049	-0.241	0.013	-0.024	-0.016
NR 310	0.00	-1.01	-0.04	0.006	-0.241	0.027	-0.003	-0.012

(Run.3)

RUN NUMBER=3 LONG BODY, ROUND NOSE, L4R88 TAIL
CANT 4NBL= 2.5 DEG. CB POSITION 50.00X
V= 240, FPE RW= 0.384 MILLION

DP.NO.	ATTITUDE			COEFFICIENTS				
	THETA	PMI	CZ	CM	CX	CY	CN	CL
NR 314	-10.09	0.02	1.78	2.251	=0.336	0.092	-0.134	0.034
NR 315	-10.10	22.51	1.77	2.234	=0.316	=0.036	0.166	0.022
NR 316	-10.11	45.00	1.78	1.169	=0.277	=0.063	0.228	0.027
NR 317	-10.13	67.51	1.70	2.035	=0.273	=0.036	0.195	0.040
NR 318	-10.15	90.00	1.65	1.965	=0.288	=0.070	0.250	0.034
NR 324	-5.05	0.00	1.02	1.331	=0.281	0.062	-0.095	-0.003
NR 325	-5.05	22.50	0.97	1.256	=0.276	=0.038	0.172	0.010
NR 322	-5.07	45.00	0.90	1.057	=0.265	=0.107	0.305	0.017
NR 321	-5.08	67.50	0.82	0.948	=0.261	=0.092	0.273	0.030
NR 320	-5.10	90.00	0.79	0.866	=0.236	=0.100	0.388	0.028
NR 325	0.00	0.00	0.11	0.242	=0.261	0.047	-0.078	-0.003
NR 326	-0.01	22.50	0.09	0.227	=0.254	=0.021	0.098	0.012
NR 327	-0.02	45.00	0.07	0.168	=0.245	=0.091	0.203	0.022
NR 328	-0.03	67.50	0.01	0.073	=0.245	=0.127	0.293	0.028
NR 329	-0.05	90.00	=0.05	=0.052	=0.243	=0.140	0.340	0.032
NR 334	5.04	-0.01	=0.69	=0.618	=0.233	0.033	-0.040	-0.021
NR 335	5.04	22.49	=0.69	=0.591	=0.233	=0.031	0.073	-0.007
NR 332	5.03	44.99	=0.72	=0.634	=0.242	=0.116	0.265	0.012
NR 331	5.02	67.50	=0.83	=0.849	=0.255	=0.183	0.427	0.029
NR 330	5.00	90.00	=0.93	=1.066	=0.270	=0.170	0.605	0.032
NR 339	10.09	-0.01	=1.57	=1.664	=0.234	=0.002	0.034	-0.022
NR 340	10.08	22.48	=1.57	=1.634	=0.222	=0.025	0.064	-0.014
NR 341	10.08	44.98	=1.59	=1.628	=0.215	=0.145	0.365	-0.012
NR 342	10.07	67.49	=1.65	=1.826	=0.243	=0.251	0.613	0.020
NR 343	10.05	89.99	=1.71	=2.011	=0.297	=0.200	0.475	0.010
NR 348	15.12	-0.01	=2.08	=2.095	=0.240	=0.028	0.097	-0.010
NR 347	15.12	22.49	=2.11	=2.135	=0.228	=0.106	0.196	-0.002
NR 346	15.12	44.96	=2.38	=2.639	=0.190	=0.178	0.625	-0.057
NR 345	15.10	67.47	=2.11	=2.117	=0.250	=0.138	0.385	-0.018
NR 344	15.08	89.98	=2.11	=2.150	=0.319	=0.201	0.442	-0.006
NR 349	20.15	-0.02	=2.49	=2.195	=0.248	=0.038	0.100	-0.030
NR 350	20.14	22.48	=2.50	=2.220	=0.236	=0.203	0.380	-0.028
NR 351	20.16	44.86	=2.91	=3.174	=0.179	=0.120	0.296	-0.207
NR 352	20.13	67.50	=2.50	=2.237	=0.278	=0.128	0.287	0.035
NR 353	20.12	89.98	=2.57	=2.320	=0.333	=0.241	0.303	0.005
NR 358	25.18	-0.01	=2.92	=2.305	=0.335	=0.108	0.216	-0.023
NR 357	25.17	22.51	=2.72	=2.004	=0.340	=0.493	0.902	0.035
NR 356	25.18	44.70	=3.34	=3.486	=0.168	0.052	-0.162	-0.469
NR 355	25.16	66.43	=2.84	=2.247	=0.341	0.233	-0.444	-0.082
NR 354	25.15	89.97	=2.97	=2.357	=0.414	=0.142	0.317	-0.024
NR 359	29.21	-0.04	=3.43	=2.697	=0.345	=0.041	0.085	-0.059
NR 360	29.19	22.54	=3.11	=2.243	=0.336	=0.629	1.163	0.080
NR 361	29.22	45.22	=3.81	=3.606	=0.101	=0.537	1.075	0.378
NR 362	29.18	67.39	=3.19	=2.476	=0.319	0.396	-0.815	-0.150

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS = R.A.E 3FT*4FT TUNNEL RESULTS.

DP.NO.	ATTITUDE			COEFFICIENTS				
	THETA	PMI	CZ	CM	CX	CY	CN	CL
NR 363	29.19	89.96	=3.52	=2.820	=0.420	=0.162	0.276	-0.034
NR 313	0.00	0.00	0.10	0.234	=0.256	0.040	-0.053	-0.003
NR 335	0.00	0.00	0.11	0.235	=0.240	0.040	-0.093	-0.004
NR 338	0.00	0.00	0.10	0.249	=0.256	0.046	-0.062	-0.005
NR 364	0.00	0.00	0.11	0.234	=0.256	0.041	-0.085	-0.007

(Run.4)

RUN NUMBER=4 LONG BODY, ROUND NOSE, LARGE TAIL
 CANT ANGLE= 5.0 CG POSITION 50.00%
 V= 240, FPS RE= 0.384 MILLION

DP.NO.	ATTITUDE		COEFFICIENTS					
	THETA	PHI	CZ	CM	CX	CY	CN	CL
NR 368	-10.09	0.03	1.86	2.409	-0.416	0.033	-0.087	0.047
NR 369	-10.10	22.51	1.82	2.362	-0.404	-0.127	0.358	0.021
NR 370	-10.12	45.01	1.88	2.473	-0.370	-0.252	0.671	0.045
NR 370	-10.11	45.01	1.89	2.970	-0.370	-0.259	1.152	0.045
NR 371	-10.13	67.52	1.77	2.180	-0.532	-0.329	0.776	0.056
NR 372	-10.15	90.01	1.61	1.847	-0.317	-0.310	0.763	0.049
NR 377	-5.06	0.02	1.30	1.913	-0.360	0.044	-0.079	0.027
NR 376	-5.06	22.52	1.23	1.809	-0.349	-0.176	0.426	0.044
NR 375	-5.07	45.01	1.09	1.492	-0.529	-0.325	0.761	0.044
NR 374	-5.09	67.51	0.92	1.118	-0.309	-0.377	0.870	0.041
NR 373	-5.10	90.00	0.76	0.801	-0.295	-0.370	0.845	0.038
NR 378	-0.02	0.01	0.38	0.756	-0.290	0.009	-0.012	0.013
NR 379	-0.02	22.51	0.32	0.684	-0.294	-0.157	0.333	0.030
NR 380	-0.02	45.01	0.22	0.502	-0.293	-0.289	0.608	0.043
NR 381	-0.04	67.51	0.07	0.215	-0.297	-0.370	0.806	0.052
NR 382	-0.05	90.01	-0.09	-0.117	-0.297	-0.400	0.884	0.054
NR 387	5.03	0.01	-0.44	-0.082	-0.245	0.001	0.033	0.009
NR 386	5.03	22.51	-0.47	-0.145	-0.243	-0.150	0.337	0.027
NR 385	5.02	45.01	-0.59	-0.357	-0.256	-0.306	0.670	0.042
NR 384	4.97	67.52	-0.20	-0.697	-0.279	-0.158	0.865	0.067
NR 383	5.01	90.02	-0.95	-1.115	-0.299	-0.420	0.925	0.060
NR 392	10.08	0.00	-1.31	-1.121	-0.195	-0.020	0.050	0.002
NR 393	10.07	22.50	-1.31	-1.100	-0.193	-0.158	0.318	0.018
NR 394	10.07	45.01	-1.40	-1.288	-0.235	-0.411	0.865	0.032
NR 395	10.06	67.52	-1.57	-1.694	-0.292	-0.500	1.061	0.057
NR 396	10.05	90.01	-1.72	-2.012	-0.336	-0.460	0.964	0.050
NR 401	15.11	-1.03	-1.99	-1.928	-0.196	-0.015	0.070	-0.045
NR 400	15.11	22.46	-2.06	-2.003	-0.164	-0.135	0.267	-0.051
NR 399	15.12	45.00	-2.20	-2.234	-0.185	-0.420	0.896	0.018
NR 398	15.10	67.50	-2.06	-1.977	-0.284	-0.429	0.916	0.037
NR 397	15.08	90.00	-2.11	-2.110	-0.363	-0.450	0.913	0.032
NR 402	20.14	-1.02	-2.43	-2.108	-0.195	-0.033	0.100	-0.039
NR 403	20.14	22.47	-2.48	-2.196	-0.167	-0.273	0.496	-0.041
NR 404	20.15	45.02	-2.79	-2.783	-0.115	-0.270	0.614	0.050
NR 405	20.13	67.52	-2.48	-2.172	-0.253	-0.379	0.790	0.058
NR 406	20.11	89.97	-2.41	-2.008	-0.447	-0.321	0.607	-0.010
NR 407	20.11	89.98	-2.41	-2.009	-0.451	-0.331	0.607	-0.009
NR 412	25.18	-1.03	-2.91	-2.288	-0.231	-0.061	0.123	-0.043
NR 411	25.17	22.47	-2.77	-2.124	-0.218	-0.363	0.628	-0.043
NR 410	25.19	45.09	-3.37	-3.321	-0.047	-0.229	0.490	0.161
NR 409	25.15	67.48	-2.76	-2.086	-0.311	-0.096	0.259	-0.009
NR 408	25.14	90.00	-2.74	-2.006	-0.464	-0.300	0.583	0.027
NR 413	29.21	-1.04	-3.37	-2.542	-0.262	-0.010	0.049	-0.071
NR 414	29.19	22.54	-3.10	-2.207	-0.267	-0.740	1.397	0.084

R=RESULTS IN ROLLING BODY AXES.
 NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.F 3PT-4PT TUNNEL RESULTS.

DP.NO.	ATTITUDE		COEFFICIENTS					
	THETA	PHI	CZ	CM	CX	CY	CN	CL
NR 415	29.21	44.94	-3.72	-3.621	0.028	-0.029	0.046	-0.071
NR 416	29.21	44.96	-3.72	-3.610	0.033	-0.048	0.086	-0.051
NR 417	29.18	67.45	-3.10	-2.284	-0.294	0.089	-0.154	-0.059
NR 418	29.16	90.01	-3.11	-2.263	-0.451	-0.219	0.433	0.044
NR 367	-0.01	0.01	0.35	0.731	-0.295	0.009	-0.012	0.013
NR 388	-0.02	0.01	0.37	0.763	-0.290	0.015	-0.005	0.019
NR 391	-0.02	0.01	0.38	0.763	-0.295	0.010	-0.020	0.018
NR 419	-0.02	0.01	0.38	0.763	-0.295	0.009	-0.013	0.018

(Run.5)

RUN NUMBER=5 LONG BODY, ROUND NOSE, LARGE TAIL
CANT ANGLE=10.0 CB POSITION 30.00X
V= 240, FPM RE= 0.384 MILLION

OP.NO.	ATTITUDE		CZ		COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 423	-10.09	0.02	1.82	2.330	-0.332	0.068	-0.134	0.032
NR 424	-10.10	22.31	1.81	2.340	-0.517	0.144	0.330	0.031
NR 425	-10.12	44.99	1.91	2.313	-0.513	0.372	0.837	0.009
NR 426	-10.14	67.51	1.97	2.390	-0.494	0.744	1.618	0.044
NR 427	-10.15	89.98	1.82	1.880	-0.430	0.819	1.731	0.008
NR 432	-5.08	0.01	1.63	2.627	-0.332	0.062	-0.140	0.018
NR 431	-5.08	22.31	1.37	2.523	-0.322	0.301	0.638	0.028
NR 430	-5.09	45.00	1.40	2.141	-0.306	0.613	1.322	0.032
NR 429	-5.09	67.49	1.11	1.530	-0.467	0.808	1.720	0.019
NR 428	-5.10	89.98	0.76	0.810	-0.423	0.890	1.853	0.005
NR 443	-0.04	0.00	0.89	1.740	-0.423	0.029	-0.069	-0.004
NR 448	-0.04	0.00	0.89	1.731	-0.423	0.042	-0.083	-0.002
NR 433	-0.04	0.00	0.89	1.748	-0.483	0.035	-0.069	-0.007
NR 434	-0.04	22.30	0.81	1.626	-0.422	0.344	0.654	0.009
NR 435	-0.04	44.90	0.61	1.260	-0.421	0.636	1.232	0.021
NR 436	-0.05	67.50	0.30	0.651	-0.430	0.830	1.709	0.032
NR 437	-0.05	90.00	-0.06	-0.052	-0.435	0.920	1.776	0.033
NR 442	5.01	0.00	-0.02	0.639	-0.314	0.026	-0.052	-0.006
NR 441	5.01	22.30	-0.08	0.580	-0.317	0.294	0.363	0.018
NR 440	5.01	45.01	-0.25	0.260	-0.340	0.590	1.154	0.037
NR 439	5.01	67.31	-0.56	-0.303	-0.378	0.827	1.650	0.031
NR 438	5.00	90.02	-0.91	-0.993	-0.427	0.920	1.899	0.060
NR 449	10.05	-0.01	-0.81	-0.169	-0.213	0.019	-0.023	-0.013
NR 450	10.03	22.30	-0.83	-0.238	-0.233	0.313	0.607	0.010
NR 431	10.06	45.01	-1.08	-0.699	-0.284	0.687	1.367	0.037
NR 432	10.06	67.31	-1.39	-1.363	-0.361	0.867	1.727	0.054
NR 433	10.05	90.00	-1.65	-1.873	-0.450	0.920	1.836	0.039
NR 459	15.10	-0.03	-1.73	-1.348	-0.118	0.004	0.030	-0.042
NR 438	15.10	22.48	-1.73	-1.308	-0.103	0.294	0.385	-0.013
NR 457	15.10	45.00	-1.88	-1.593	-0.200	0.763	1.372	0.019
NR 436	15.09	67.49	-1.86	-1.654	-0.333	0.759	1.316	0.008
NR 455	15.07	89.94	-1.88	-1.698	-0.522	0.742	1.657	-0.066
NR 454	15.07	89.94	-1.88	-1.698	-0.322	0.732	1.463	-0.064
NR 460	20.14	-0.02	-2.72	-1.873	-0.102	0.017	0.070	-0.036
NR 461	20.14	22.44	-2.43	-2.099	-0.040	0.251	0.463	-0.089
NR 462	20.14	44.97	-2.52	-2.256	-0.095	0.602	1.263	-0.026
NR 463	20.14	44.96	-2.53	-2.289	-0.091	0.590	1.231	-0.047
NR 464	20.12	67.51	-2.33	-1.882	-0.283	0.726	1.439	0.054
NR 465	20.10	89.97	-2.25	-1.719	-0.375	0.611	1.191	-0.013
NR 471	25.17	-0.03	-2.84	-2.154	-0.073	0.074	0.157	-0.043
NR 470	25.17	22.36	-2.80	-2.173	-0.055	0.484	0.878	-0.048
NR 469	25.18	45.06	-3.03	-2.644	0.011	0.584	1.196	0.121
NR 468	25.18	45.06	-3.05	-2.632	0.011	0.573	1.200	0.120
NR 467	25.11	67.49	-2.11	-1.933	-0.283	0.224	0.922	0.003
NR 466	25.13	90.01	-2.65	-1.876	-0.543	0.570	1.108	0.043

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS = R.A.E 3FT-4FT TUNNEL RESULTS.

OP.NO.	ATTITUDE		CZ		COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 478	28.96	0.00	1.04	1.734	0.102	0.029	-0.076	-0.007
NR 472	29.21	-0.05	-3.32	-2.469	-0.080	0.034	0.081	-0.074
NR 473	29.20	22.48	-3.21	-2.476	-0.017	0.540	1.010	-0.016
NR 474	29.21	44.98	-3.56	-3.169	0.112	-0.351	0.686	-0.019
NR 475	29.21	44.98	-3.57	-3.188	0.112	-0.372	0.716	-0.009
NR 476	29.18	67.44	-3.04	-2.151	-0.289	0.168	0.339	-0.068
NR 477	29.16	90.01	-3.12	-2.265	-0.519	0.439	0.890	0.054
NR 422	-0.04	0.00	0.88	1.732	-0.418	0.023	-0.068	-0.007
NR 479	-0.04	0.00	0.89	1.724	-0.483	0.029	-0.076	-0.007

(Run.19)

RUN NUMBER=19 LONG BODY, SQUARE NOSE, LARGE TAIL
CANT ANGLE= 0.0 DEG. CB POSITION 50.00X
V= 240, FPS RE= 0.384 MILLION

DP.NO.	ATTITUDE		COEFFICIENTS					
	THETA	PHI	CZ	CM	CX	CY	CN	CL
NR 1408	-10.09	0.01	1.72	2.225	-0.952	0.079	-0.094	0.011
NR 1409	-10.09	0.01	1.73	2.223	-0.952	0.080	-0.102	0.011
NR 1410	-10.09	22.49	1.67	2.090	-0.932	-0.027	0.168	0.003
NR 1411	-10.09	22.49	1.67	2.087	-0.932	-0.027	0.176	0.004
NR 1412	-10.11	44.99	1.58	1.886	-0.908	0.056	0.024	0.019
NR 1413	-10.11	45.00	1.58	1.886	-0.908	0.055	0.047	0.023
NR 1414	-10.13	67.50	1.64	1.980	-0.919	0.181	-0.190	0.045
NR 1415	-10.13	67.50	1.63	1.983	-0.919	0.179	-0.183	0.045
NR 1416	-10.15	89.99	1.70	2.096	-0.939	0.120	-0.028	0.027
NR 1417	-10.15	89.99	1.69	2.096	-0.939	0.120	-0.055	0.024
NR 1425	-5.04	-0.01	0.80	1.060	-0.904	0.046	-0.043	-0.010
NR 1423	-5.04	22.49	0.77	1.020	-0.898	0.034	0.009	-0.003
NR 1424	-5.04	22.49	0.77	1.008	-0.898	0.033	0.021	-0.001
NR 1422	-5.06	44.99	0.75	0.948	-0.903	0.043	0.046	0.014
NR 1420	-5.08	67.50	0.75	0.924	-0.903	0.060	0.087	0.030
NR 1421	-5.08	67.49	0.74	0.929	-0.898	0.058	0.036	0.024
NR 1418	-5.10	89.99	0.75	0.919	-0.903	0.080	0.056	0.022
NR 1419	-5.10	89.99	0.75	0.919	-0.908	0.080	0.056	0.019
NR 1426	0.00	-0.01	-0.06	-0.050	-0.884	0.038	-0.025	-0.016
NR 1427	0.00	22.49	-0.08	-0.043	-0.882	0.020	0.034	0.005
NR 1428	-0.01	44.99	-0.09	-0.079	-0.881	0.019	0.079	0.018
NR 1429	-0.03	67.49	-0.11	-0.122	-0.881	0.029	0.116	0.027
NR 1430	-0.05	89.99	-0.11	-0.182	-0.886	0.040	0.116	0.024
NR 1434	5.05	-0.01	-0.92	-1.135	-0.908	0.022	0.052	-0.021
NR 1440	5.05	-0.02	-0.92	-1.143	-0.908	0.023	0.025	-0.027
NR 1437	5.04	22.58	-0.90	-1.109	-0.906	0.015	0.048	-0.021
NR 1438	5.04	22.58	-0.92	-1.120	-0.906	0.012	0.052	-0.019
NR 1435	5.03	44.98	-0.91	-1.081	-0.909	-0.000	0.124	0.003
NR 1436	5.03	44.98	-0.91	-1.083	-0.909	-0.005	0.135	0.000
NR 1433	5.02	67.49	-0.95	-1.184	-0.908	-0.014	0.185	0.028
NR 1434	5.02	67.49	-0.95	-1.182	-0.913	-0.014	0.192	0.028
NR 1431	5.00	89.99	-0.99	-1.285	-0.918	0.010	0.159	0.016
NR 1432	5.00	89.98	-0.99	-1.284	-0.918	0.010	0.174	0.014
NR 1441	10.09	-0.02	-1.80	-2.228	-0.933	-0.014	0.116	-0.038
NR 1442	10.09	-0.02	-1.79	-2.236	-0.933	-0.019	0.100	-0.037
NR 1443	10.09	22.46	-1.76	-2.135	-0.936	0.053	-0.067	-0.044
NR 1444	10.09	22.47	-1.77	-2.125	-0.931	0.048	-0.071	-0.034
NR 1445	10.08	44.98	-1.73	-1.981	-0.919	-0.034	0.149	-0.009
NR 1446	10.08	44.98	-1.73	-1.981	-0.919	-0.034	0.139	-0.010
NR 1447	10.07	67.49	-1.81	-2.181	-0.941	-0.124	0.413	0.025
NR 1448	10.07	67.50	-1.82	-2.171	-0.941	-0.126	0.399	0.028
NR 1449	10.05	89.99	-1.87	-2.571	-0.945	-0.030	0.225	0.020
NR 1450	10.05	89.99	-1.88	-2.555	-0.941	-0.040	0.233	0.016
NR 1456	15.13	-0.03	-2.30	-2.352	-0.995	-0.030	0.094	-0.045
NR 1457	15.13	-0.03	-2.30	-2.344	-0.993	-0.036	0.103	-0.045
NR 1458	15.13	22.53	-2.41	-2.506	-0.962	-0.047	0.136	0.067
NR 1459	15.13	22.53	-2.41	-2.506	-0.962	-0.053	0.136	0.069

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E 3FT*4FT TUNNEL RESULTS.

DP.NO.	ATTITUDE		COEFFICIENTS					
	THETA	PHI	CZ	CM	CX	CY	CN	CL
NR 1460	15.13	44.98	-2.61	-2.849	-0.930	-0.070	0.195	-0.013
NR 1461	15.13	44.97	-2.61	-2.843	-0.930	-0.070	0.202	-0.015
NR 1462	15.11	67.42	-2.45	-2.617	-0.944	-0.067	0.242	-0.088
NR 1463	15.11	67.42	-2.46	-2.621	-0.944	-0.060	0.252	-0.089
NR 1464	15.09	90.00	-2.37	-2.468	-1.008	-0.050	0.192	0.041
NR 1465	15.09	90.00	-2.37	-2.476	-1.008	-0.050	0.192	0.041
NR 1473	20.18	22.57	-3.00	-2.523	-1.015	-0.303	0.547	0.133
NR 1474	20.17	0.07	-2.89	-2.395	-1.034	-0.045	0.100	-0.050
NR 1472	20.18	22.57	-3.01	-2.530	-1.025	-0.300	0.543	0.137
NR 1470	20.19	45.00	-3.36	-5.241	-0.949	-0.182	0.399	0.029
NR 1471	20.19	45.01	-3.37	-5.258	-0.949	-0.191	0.405	0.038
NR 1468	20.16	67.39	-3.06	-2.681	-1.009	0.059	-0.080	-0.150
NR 1469	20.16	67.39	-3.04	-2.670	-1.009	0.064	-0.077	-0.153
NR 1466	20.14	90.01	-2.97	-2.506	-1.048	-0.099	0.151	0.056
NR 1467	20.14	90.01	-2.97	-2.505	-1.053	-0.089	0.189	0.048
NR 1475	25.22	0.06	-3.63	-2.646	-1.080	-0.043	0.063	-0.073
NR 1476	25.22	0.06	-3.63	-2.662	-1.075	-0.050	0.072	-0.061
NR 1477	25.23	22.65	-3.74	-2.740	-1.086	-0.535	0.937	0.252
NR 1478	25.23	22.64	-3.75	-2.732	-1.091	-0.539	0.898	0.240
NR 1479	25.24	45.00	-4.09	-5.507	-0.942	-0.276	0.404	0.017
NR 1480	25.24	44.99	-4.11	-5.535	-0.942	-0.267	0.410	0.013
NR 1481	25.21	67.29	-3.79	-2.900	-1.092	0.256	-0.506	-0.317
NR 1482	25.21	67.29	-3.80	-2.924	-1.092	0.232	-0.536	-0.313
NR 1483	25.20	89.99	-3.72	-2.773	-1.091	-0.121	0.191	0.017
NR 1484	25.20	90.02	-3.72	-2.766	-1.086	-0.129	0.136	0.061
NR 1497	0.00	-0.01	-0.06	-0.058	-0.889	0.038	-0.025	-0.014
NR 1451	0.00	-0.01	-0.07	-0.050	-0.884	0.032	-0.041	-0.010
NR 1452	0.00	-0.01	-0.07	-0.058	-0.889	0.032	-0.033	-0.009
NR 1455	0.00	-0.01	-0.07	-0.058	-0.884	0.019	-0.032	-0.016
NR 1455	0.00	-0.01	-0.06	-0.065	-0.879	0.001	-0.015	-0.016
NR 1486	0.00	-0.01	-0.06	-0.057	-0.874	0.001	-0.015	-0.016

(Run.32)

RUN NUMBER=32 LONG BODY, SQUARE NOSE, LARGE TAIL
CANT ANGLE= 2.5 DEG. CO POSITION 50.00X
V= 240. FPS RE= 0.384 MILLION

OP.NO.	ATTITUDE		COEFFICIENTS				CM	CL	
	THETA	PHI	CZ	CM	CX	CY			
NR	2265	-10.09	0.12	1.92	2.633	-1.007	0.077	-0.159	0.033
NR	2266	-10.10	0.12	1.92	2.610	-1.002	0.077	-0.175	0.031
NR	2267	-10.10	22.51	1.85	2.494	-0.987	-0.091	0.235	0.037
NR	2268	-10.10	22.51	1.85	2.488	-0.982	-0.091	0.232	0.037
NR	2269	-10.11	45.01	1.72	2.224	-0.948	-0.088	0.264	0.047
NR	2270	-10.13	67.51	1.69	2.194	-0.944	-0.015	0.147	0.052
NR	2271	-10.15	90.00	1.70	2.205	-0.955	-0.040	0.262	0.037
NR	2276	-5.05	0.10	1.00	1.445	-0.929	0.045	-0.110	0.000
NR	2275	-5.05	22.49	0.97	1.383	-0.923	-0.043	0.101	0.004
NR	2274	-5.06	45.00	0.88	1.241	-0.918	-0.078	0.217	0.025
NR	2273	-5.08	67.00	0.82	1.131	-0.918	-0.066	0.265	0.042
NR	2272	-5.10	90.00	0.77	1.020	-0.913	-0.070	0.315	0.036
NR	2277	0.00	0.10	0.08	0.202	-0.894	0.032	-0.068	-0.007
NR	2278	-0.01	22.50	0.06	0.192	-0.892	-0.041	0.085	0.010
NR	2279	-0.02	45.00	0.01	0.125	-0.892	-0.090	0.233	0.027
NR	2280	-0.03	67.49	-0.06	0.030	-0.886	-0.110	0.325	0.028
NR	2281	-0.03	67.50	-0.05	0.009	-0.891	-0.108	0.318	0.034
NR	2282	-0.05	90.00	-0.10	-0.122	-0.891	-0.100	0.367	0.040
NR	2288	5.04	-0.01	-0.73	-0.804	-0.899	0.013	-0.012	-0.019
NR	2287	5.04	22.48	-0.74	-0.800	-0.902	-0.074	0.147	-0.014
NR	2285	5.03	45.00	-0.79	-0.850	-0.905	-0.139	0.305	0.022
NR	2286	5.03	45.00	-0.79	-0.839	-0.905	-0.143	0.316	0.022
NR	2284	5.02	67.51	-0.90	-1.056	-0.918	-0.145	0.405	0.054
NR	2283	5.00	90.01	-0.98	-1.233	-0.923	-0.130	0.410	0.050
NR	2289	10.04	-0.01	-0.71	-0.795	-0.802	0.013	-0.012	-0.024
NR	2290	10.09	-0.01	-1.63	-1.891	-0.909	-0.009	0.046	-0.022
NR	2291	10.09	-0.01	-1.63	-1.898	-0.909	-0.010	0.062	-0.024
NR	2292	10.08	22.47	-1.61	-1.788	-0.897	-0.009	0.037	-0.026
NR	2293	10.08	22.47	-1.61	-1.809	-0.897	-0.016	0.028	-0.028
NR	2294	10.08	44.99	-1.60	-1.720	-0.894	-0.159	0.390	0.005
NR	2295	10.08	44.99	-1.60	-1.720	-0.894	-0.171	0.390	0.009
NR	2296	10.07	67.51	-1.75	-2.047	-0.927	-0.268	0.663	0.049
NR	2297	10.07	67.50	-1.75	-2.047	-0.927	-0.271	0.664	0.040
NR	2298	10.05	89.99	-1.87	-2.327	-0.961	-0.170	0.485	0.031
NR	2299	10.05	90.00	-1.87	-2.327	-0.956	-0.170	0.493	0.034
NR	2308	15.13	0.00	-2.30	-2.406	-0.945	-0.024	0.110	-0.004
NR	2309	15.13	0.00	-2.30	-2.406	-0.945	-0.030	0.102	-0.006
NR	2306	15.13	22.55	-2.36	-2.440	-0.913	-0.086	0.163	0.092
NR	2307	15.13	22.55	-2.36	-2.449	-0.923	-0.087	0.167	0.094
NR	2304	15.13	44.97	-2.47	-2.605	-0.896	-0.198	0.410	-0.015
NR	2305	15.13	44.98	-2.47	-2.616	-0.900	-0.198	0.410	-0.008
NR	2302	15.11	67.40	-2.40	-2.497	-0.964	-0.186	0.458	-0.122
NR	2303	15.11	67.41	-2.39	-2.495	-0.964	-0.204	0.423	-0.113
NR	2300	15.09	89.99	-2.35	-2.431	-1.008	-0.200	0.436	0.023
NR	2301	15.09	89.99	-2.35	-2.439	-1.008	-0.190	0.444	0.020
NR	2310	20.17	-0.01	-2.87	-2.395	-0.989	-0.036	0.094	-0.012

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS = R.A.E 3FT-4FT TUNNEL RESULTS.

	DP.NO.	ATTITUDE		COEFFICIENTS					
		THETA	PHI	CZ	CM	CX	CY	CN	CL
NR	2311	20.17	-0.01	-2.89	-2.410	-0.994	-0.049	0.103	-0.010
NR	2312	20.18	22.60	-3.04	-2.594	-0.956	-0.266	0.490	0.175
NR	2313	20.18	22.60	-3.04	-2.625	-0.956	-0.267	0.504	0.181
NR	2314	20.18	44.94	-3.27	-3.100	-0.911	-0.117	0.177	-0.076
NR	2315	20.18	44.93	-3.25	-3.109	-0.906	-0.128	0.178	-0.082
NR	2316	20.16	67.37	-3.00	-2.591	-1.014	-0.049	0.046	-0.171
NR	2317	20.16	67.38	-2.99	-2.552	-1.000	-0.055	0.113	-0.166
NR	2318	20.14	90.00	-2.96	-2.477	-1.049	-0.230	0.403	0.039
NR	2319	20.14	90.01	-2.96	-2.478	-1.049	-0.229	0.379	0.049
NR	2320	25.20	89.99	-3.72	-2.770	-1.086	-0.211	0.403	0.025
NR	2264	0.00	0.10	0.09	0.195	-0.889	0.025	-0.060	-0.003
NR	2321	0.00	0.00	0.08	0.203	-0.899	0.027	-0.036	-0.006
NR	2322	0.00	0.00	0.09	0.218	-0.889	0.027	-0.045	-0.001

(Run.33)

RUN NUMBER=33 LONG BODY, SQUARE NOSE, LARGE TAIL
CANT ANGLE= 5.0 CB POSITION 50.00%
V= 240. FPS RE= 0.384 MILLION

	OP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
		THETA	PMI			CX	CY		
NR	2326	-10.10	0.03	2.02	2.824	-1.093	0.044	-0.109	0.042
NR	2327	-10.10	0.03	2.02	2.831	-1.090	0.038	-0.117	0.041
NR	2328	-10.10	22.36	2.00	2.832	-1.070	-0.133	0.388	0.111
NR	2329	-10.10	22.36	2.00	2.829	-1.070	-0.133	0.396	0.117
NR	2330	-10.12	43.03	1.92	2.591	-1.031	-0.302	0.689	0.074
NR	2331	-10.12	43.03	1.91	2.381	-1.026	-0.299	0.679	0.073
NR	2334	-10.13	90.00	1.66	2.106	-0.979	-0.280	0.891	0.031
NR	2344	-5.06	0.02	1.31	2.021	-0.997	0.038	-0.080	0.027
NR	2345	-5.06	0.02	1.31	2.021	-0.993	0.026	-0.088	0.028
NR	2342	-3.06	22.30	1.22	1.879	-0.987	-0.188	0.368	0.013
NR	2343	-3.06	22.30	1.22	1.890	-0.987	-0.194	0.364	0.020
NR	2340	-3.07	43.10	1.03	1.569	-0.987	-0.309	0.632	0.027
NR	2341	-3.07	43.10	1.03	1.568	-0.967	-0.314	0.633	0.023
NR	2338	-5.08	67.30	0.88	1.238	-0.937	-0.329	0.734	0.031
NR	2339	-5.08	67.30	0.87	1.238	-0.937	-0.331	0.734	0.031
NR	2336	-3.10	89.98	0.72	0.932	-0.938	-0.300	0.719	0.012
NR	2337	-3.10	89.99	0.72	0.932	-0.938	-0.290	0.727	0.018
NR	2346	-0.01	0.01	0.31	0.629	-0.924	0.010	-0.034	0.009
NR	2347	-0.02	22.31	0.27	0.581	-0.927	-0.133	0.283	0.031
NR	2348	-0.02	43.01	0.13	0.416	-0.928	-0.283	0.348	0.042
NR	2349	-0.04	67.31	0.02	0.132	-0.923	-0.339	0.729	0.036
NR	2330	-0.03	90.01	-0.14	-0.149	-0.930	-0.330	0.802	0.039
NR	2358	3.03	0.00	-0.43	-0.298	-0.914	-0.023	0.014	0.001
NR	2339	3.03	0.00	-0.43	-0.298	-0.914	-0.022	-0.002	0.000
NR	2336	3.03	22.30	-0.51	-0.348	-0.921	-0.206	0.378	0.016
NR	2337	3.03	22.30	-0.31	-0.343	-0.916	-0.211	0.371	0.014
NR	2335	3.02	43.01	-0.64	-0.343	-0.929	-0.329	0.638	0.046
NR	2333	3.01	67.33	-0.83	-0.908	-0.933	-0.378	0.830	0.084
NR	2334	5.01	67.33	-0.83	-0.914	-0.938	-0.378	0.813	0.082
NR	2331	3.00	90.03	-1.00	-1.242	-0.932	-0.369	0.867	0.082
NR	2332	3.00	90.03	-1.00	-1.242	-0.932	-0.369	0.867	0.081
NR	2360	10.08	0.00	-1.34	-1.308	-0.880	-0.043	0.042	-0.003
NR	2361	10.08	0.00	-1.34	-1.316	-0.873	-0.031	0.033	-0.004
NR	2362	10.07	22.49	-1.33	-1.233	-0.877	-0.173	0.318	-0.000
NR	2363	10.07	22.49	-1.33	-1.233	-0.877	-0.173	0.318	-0.003
NR	2364	10.07	43.01	-1.43	-1.371	-0.909	-0.429	0.867	0.032
NR	2365	10.07	43.01	-1.43	-1.371	-0.904	-0.433	0.836	0.030
NR	2366	10.07	67.32	-1.70	-1.904	-0.936	-0.510	1.101	0.070
NR	2367	10.07	67.32	-1.71	-1.906	-0.941	-0.313	1.101	0.069
NR	2368	10.06	90.02	-1.90	-2.321	-1.003	-0.409	0.941	0.071
NR	2369	10.06	90.03	-1.91	-2.322	-1.003	-0.419	0.926	0.081

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED PIN BOMBLETS - R.A.E. 3PT-4PT TUNNEL RESULTS.

	DP. NO.	ATTITUDE		COEFFICIENTS					
		THETA	PMI	CZ	CM	CX	CY	CN	CL
NR	2378	13.12	-0.02	-2.17	-2.162	-0.877	-0.072	0.094	-0.040
NR	2379	13.12	-0.02	-2.17	-2.162	-0.882	-0.063	0.077	-0.041
NR	2376	15.12	22.49	-2.23	-2.162	-0.830	-0.141	0.189	-0.009
NR	2377	15.12	22.49	-2.22	-2.138	-0.843	-0.143	0.182	-0.009
NR	2374	13.12	43.00	-2.32	-2.210	-0.881	-0.466	0.893	0.024
NR	2375	15.12	43.00	-2.31	-2.203	-0.886	-0.462	0.890	0.027
NR	2372	13.11	67.44	-2.36	-2.330	-0.983	-0.481	0.983	-0.069
NR	2373	15.11	67.43	-2.36	-2.330	-0.983	-0.473	0.983	-0.073
NR	2370	13.09	90.02	-2.37	-2.401	-1.037	-0.449	0.923	0.068
NR	2371	13.09	90.01	-2.37	-2.393	-1.032	-0.440	0.916	0.063
NR	2380	20.17	-0.03	-2.84	-2.340	-0.926	-0.096	0.081	-0.047
NR	2381	20.17	-0.03	-2.84	-2.353	-0.916	-0.093	0.073	-0.048
NR	2382	20.17	22.36	-2.98	-2.314	-0.873	-0.281	0.463	0.117
NR	2383	20.17	22.37	-2.98	-2.314	-0.878	-0.292	0.463	0.128
NR	2384	20.18	44.92	-3.19	-2.801	-0.862	-0.363	0.373	-0.100
NR	2385	20.18	44.92	-3.18	-2.780	-0.862	-0.359	0.372	-0.107
NR	2386	20.16	67.42	-2.97	-2.463	-1.014	-0.369	0.710	-0.103
NR	2387	20.16	67.43	-2.97	-2.473	-1.009	-0.379	0.706	-0.088
NR	2388	20.14	90.03	-2.99	-2.383	-1.103	-0.468	0.834	0.081
NR	2389	20.14	90.01	-2.99	-2.384	-1.103	-0.469	0.881	0.039
NR	2325	-0.01	0.01	0.31	0.629	-0.923	0.013	-0.027	0.017
NR	2390	-0.01	0.10	0.32	0.638	-0.934	-0.043	-0.023	0.004

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

(Run.16)

RUN NUMBER=16 LONG BODY, SQUARE NOSE, LARGE TAIL
CANT ANGLE=10.0 CG POSITION 90.00X
V= 240, FPE RE= 0.384 MILLION

OR.NO.	ATTITUDE						COEFFICIENTS		CN	CL
	THETA	PHI	CZ	CM	CX	CY				
NR 1218	-10.10	0.02	1.96	2.709	-1.213	0.063	-0.124	0.028		
NR 1218	-10.09	0.02	1.96	2.939	-1.213	0.065	-0.128	0.028		
NR 1219	-10.10	0.02	1.96	2.690	-1.213	0.062	-0.108	0.027		
NR 1220	-10.10	22.56	1.98	2.792	-1.198	-0.103	0.334	0.121		
NR 1221	-10.10	22.56	1.98	2.798	-1.203	-0.108	0.921	0.118		
NR 1222	-10.13	43.08	2.08	8.913	-1.179	-0.401	0.988	0.155		
NR 1223	-10.13	43.08	2.08	2.913	-1.178	-0.397	0.967	0.162		
NR 1224	-10.14	67.48	1.94	2.609	-1.133	-0.648	1.425	0.009		
NR 1225	-10.14	67.48	1.94	2.618	-1.133	-0.639	1.433	0.009		
NR 1226	-10.15	89.94	1.66	8.096	-1.077	-0.688	1.470	-0.054		
NR 1227	-10.15	89.94	1.66	2.088	-1.077	-0.688	1.470	-0.054		
NR 1235	-5.08	0.01	1.73	2.901	-1.160	0.081	-0.182	0.017		
NR 1236	-5.08	0.01	1.73	2.901	-1.160	0.075	-0.152	0.017		
NR 1237	-5.08	0.01	1.73	2.901	-1.160	0.075	-0.152	0.015		
NR 1233	-5.08	22.49	1.63	2.721	-1.169	-0.312	0.696	0.004		
NR 1234	-5.08	22.49	1.63	2.706	-1.169	-0.303	0.690	0.002		
NR 1231	-5.09	44.97	1.37	8.176	-1.115	-0.597	1.297	-0.018		
NR 1232	-5.09	44.97	1.36	2.171	-1.110	-0.602	1.291	-0.015		
NR 1230	-5.09	67.43	1.03	1.319	-1.080	-0.719	1.482	-0.039		
NR 1228	-5.10	89.93	0.74	0.943	-1.031	-0.699	1.468	-0.067		
NR 1229	-5.10	89.94	0.74	0.943	-1.031	-0.699	1.476	-0.063		
NR 1238	-0.03	-0.01	0.70	1.361	-1.027	0.047	-0.093	-0.009		
NR 1239	-0.03	22.30	0.64	1.273	-1.086	-0.260	0.304	0.013		
NR 1240	-0.04	45.00	0.48	0.973	-1.083	-0.924	1.010	0.031		
NR 1241	-0.04	67.31	0.21	0.492	-1.029	-0.683	1.372	0.043		
NR 1242	-0.05	90.01	-0.09	-0.087	-1.036	-0.740	1.934	0.050		
NR 1251	5.01	-0.01	-0.08	0.379	-0.978	0.032	-0.056	-0.010		
NR 1249	5.01	22.50	-0.16	0.288	-0.981	-0.304	0.369	0.017		
NR 1250	5.01	22.50	-0.15	0.300	-0.981	-0.308	0.381	0.017		
NR 1247	5.01	43.02	-0.34	-0.029	-0.998	-0.553	1.089	0.038		
NR 1248	5.01	43.02	-0.35	-0.034	-0.998	-0.558	1.095	0.054		
NR 1245	5.01	67.53	-0.65	-0.584	-1.018	-0.680	1.411	0.117		
NR 1246	5.00	67.53	-0.65	-0.587	-1.017	-0.680	1.404	0.110		
NR 1243	5.00	90.06	-0.93	-1.150	-1.031	-0.729	1.358	0.141		
NR 1244	5.00	90.06	-0.93	-1.150	-1.031	-0.719	1.366	0.136		
NR 1256	10.06	-0.01	-0.89	-0.396	-0.900	-0.007	-0.002	-0.022		
NR 1257	10.06	-0.01	-0.89	-0.389	-0.900	-0.007	-0.018	-0.018		
NR 1258	10.06	22.49	-0.93	-0.431	-0.917	-0.317	0.433	-0.003		
NR 1259	10.06	22.49	-0.93	-0.433	-0.917	-0.321	0.416	0.001		
NR 1260	10.06	43.02	-1.15	-0.827	-0.963	-0.669	1.369	0.058		
NR 1261	10.06	43.02	-1.15	-0.821	-0.963	-0.669	1.364	0.058		
NR 1262	10.06	67.54	-1.51	-1.574	-1.023	-0.799	1.694	0.093		
NR 1262	10.06	67.54	-1.51	-1.484	-1.023	-0.798	1.905	0.093		
NR 1263	10.06	67.53	-1.52	-1.579	-1.080	-0.801	1.703	0.092		
NR 1264	10.05	90.05	-1.81	-2.194	-1.093	-0.768	1.700	0.117		
NR 1265	10.05	90.05	-1.81	-2.195	-1.089	-0.768	1.684	0.120		
NR 1274	15.11	-0.02	-1.86	-1.448	-0.809	-0.025	0.048	-0.028		

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTRD FIN BOMBLETS - R.A.E 3FT*4FT TUNNEL RESULTS.

OR.NO.	ATTITUDE						COEFFICIENTS		CN	CL
	THETA	PHI	CZ	CM	CX	CY				
NR 1275	15.11	-0.02	-1.86	-1.456	-0.809	-0.024	0.048	-0.033		
NR 1272	15.11	22.59	-1.85	-1.368	-0.826	-0.267	0.508	0.000		
NR 1273	15.11	22.49	-1.85	-1.360	-0.821	-0.263	0.313	0.000		
NR 1270	15.11	43.01	-2.02	-1.617	-0.915	-0.757	1.348	0.048		
NR 1271	15.11	43.00	-2.01	-1.621	-0.913	-0.749	1.542	0.031		
NR 1268	15.10	67.42	-2.17	-2.031	-1.043	-0.752	1.351	-0.088		
NR 1269	15.10	67.43	-2.17	-2.026	-1.043	-0.751	1.364	-0.086		
NR 1266	15.09	90.01	-2.24	-2.216	-1.141	-0.780	1.612	0.054		
NR 1267	15.09	90.01	-2.26	-2.232	-1.131	-0.790	1.628	0.053		
NR 1276	20.16	-0.03	-2.72	-2.089	-0.803	-0.038	0.050	-0.042		
NR 1277	20.16	-0.03	-2.72	-2.089	-0.803	-0.050	0.033	-0.041		
NR 1278	20.16	22.51	-2.74	-2.064	-0.766	-0.263	0.457	0.029		
NR 1279	20.16	22.52	-2.75	-2.058	-0.766	-0.259	0.442	0.039		
NR 1280	20.13	67.42	-2.80	-2.173	-1.058	-0.635	1.246	-0.102		
NR 1281	20.13	67.42	-2.80	-2.153	-1.039	-0.632	1.233	-0.103		
NR 1282	20.13	90.04	-2.81	-2.184	-1.207	-0.768	1.473	0.100		
NR 1283	20.13	90.04	-2.81	-2.183	-1.207	-0.768	1.496	0.102		
NR 1217	-0.03	0.00	0.69	1.333	-1.022	0.033	-0.079	0.000		
NR 1217	-0.03	0.00	0.69	1.422	-1.022	0.033	-0.080	0.000		
NR 1252	-0.03	0.00	0.70	1.369	-1.027	0.040	-0.093	0.001		
NR 1255	-0.03	0.00	0.69	1.368	-1.017	0.028	-0.087	-0.003		
NR 1284	-0.03	0.00	0.69	1.376	-1.017	0.034	-0.087	-0.002		

(Run.6)

RUN NUMBER=6 LONG BODY, ROUND NOSE, SMALL TAIL
 CANT ANGLE= 0.0 DEG. CG POSITION 50.00%
 V= 240. FPS RE= 0.384 MILLION

DP. NO.	ATTITUDE		COEFFICIENTS					
	THETA	PHI	CZ	CM	CX	CY	CN	CL
NR 484	-10.05	0.00	0.74	0.120	-0.209	0.018	0.004	0.003
NR 485	-10.05	22.50	0.68	0.070	-0.212	-0.027	0.127	0.017
NR 486	-10.06	45.00	0.65	-0.011	-0.210	0.025	0.047	0.029
NR 487	-10.08	67.50	0.66	0.000	-0.210	0.091	-0.028	0.038
NR 488	-10.10	90.00	0.70	0.024	-0.203	0.070	0.030	0.037
NR 493	-5.02	0.10	0.32	-0.014	-0.203	-0.008	0.041	0.000
NR 492	-5.03	22.60	0.30	-0.029	-0.201	-0.017	0.060	0.013
NR 491	-5.04	45.00	0.28	-0.056	-0.200	0.021	0.045	0.026
NR 490	-5.05	67.50	0.27	-0.076	-0.199	0.059	0.018	0.035
NR 489	-5.07	90.00	0.30	-0.073	-0.204	0.040	0.042	0.040
NR 494	0.00	0.10	-0.03	0.007	-0.191	-0.016	0.040	0.000
NR 495	0.00	22.50	-0.07	-0.012	-0.193	-0.014	0.038	0.017
NR 496	-0.01	45.00	-0.08	-0.034	-0.194	0.000	0.042	0.030
NR 497	-0.03	67.50	-0.09	-0.063	-0.194	0.026	0.036	0.039
NR 498	-0.04	90.00	-0.08	-0.070	-0.204	0.040	0.029	0.034
NR 503	5.03	0.00	-0.39	-0.011	-0.209	-0.004	0.008	-0.003
NR 502	5.02	22.60	-0.39	-0.003	-0.209	-0.008	0.016	0.013
NR 501	5.01	45.00	-0.40	0.007	-0.213	-0.004	0.040	0.027
NR 500	5.00	67.50	-0.42	-0.040	-0.217	0.000	0.068	0.035
NR 499	4.98	90.00	-0.43	-0.072	-0.218	0.030	0.030	0.034
NR 529	10.05	-0.01	-0.77	-0.129	-0.206	-0.007	0.018	-0.009
NR 530	10.05	22.50	-0.76	-0.073	-0.213	0.016	-0.040	0.010
NR 531	10.04	45.00	-0.74	-0.043	-0.222	-0.023	0.044	0.027
NR 532	10.03	67.50	-0.78	-0.126	-0.222	-0.064	0.135	0.032
NR 533	10.01	90.00	-0.83	-0.219	-0.222	-0.010	0.036	0.034
NR 538	15.08	-0.01	-1.25	-0.414	-0.218	-0.019	0.046	-0.015
NR 537	15.08	22.50	-1.21	-0.308	-0.206	0.045	-0.109	0.008
NR 536	15.07	45.00	-1.17	-0.223	-0.213	-0.034	0.067	0.021
NR 535	15.06	67.49	-1.22	-0.324	-0.217	-0.125	0.235	0.027
NR 534	15.05	90.00	-1.31	-0.482	-0.222	-0.030	0.076	0.035
NR 539	20.12	-0.01	-1.79	-0.770	-0.210	-0.031	0.076	-0.022
NR 540	20.11	22.50	-1.65	-0.523	-0.201	0.102	-0.205	0.022
NR 541	20.10	44.99	-1.63	-0.499	-0.196	-0.043	0.056	0.009
NR 542	20.09	67.48	-1.64	-0.313	-0.196	-0.192	0.307	0.006
NR 543	20.08	89.99	-1.83	-0.819	-0.220	-0.050	0.070	0.026
NR 546	25.15	-0.02	-2.33	-1.111	-0.191	-0.031	0.089	-0.036
NR 547	25.14	22.58	-2.03	-0.370	-0.269	-0.106	0.112	0.140
NR 546	25.13	44.99	-2.11	-0.754	-0.186	-0.046	0.044	0.018
NR 545	25.12	67.40	-2.00	-0.577	-0.271	0.013	-0.043	-0.125
NR 544	25.11	90.00	-2.07	-0.688	-0.192	-0.080	0.092	0.044
NR 549	29.18	-0.08	-2.67	-1.188	-0.196	0.109	-0.138	-0.127
NR 550	29.16	22.60	-2.37	-0.763	-0.264	-0.142	0.208	0.177
NR 551	29.16	44.99	-2.39	-0.783	-0.186	-0.042	0.075	0.010
NR 552	29.14	67.38	-2.35	-0.799	-0.241	0.017	-0.052	-0.166

R=RESULTS IN ROLLING BODY AXES.
 NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E 3FT*4FT TUNNEL RESULTS.

DP. NO.	ATTITUDE		COEFFICIENTS					
	THETA	PHI	CZ	CM	CX	CY	CN	CL
NR 553	29.13	89.97	-2.33	-0.735	-0.212	-0.041	0.024	-0.006
NR 483	0.00	0.00	-0.03	0.015	-0.196	-0.001	0.032	0.001
NR 504	0.00	0.00	-0.04	0.007	-0.196	-0.020	0.025	0.001
NR 528	0.00	0.00	-0.01	0.023	-0.191	-0.013	0.024	-0.001
NR 554	0.00	0.00	-0.02	0.007	-0.201	-0.007	0.032	0.001

(Run.31)

RUN NUMBER=31 LONG BODY, ROUND NOSE, SMALL TAIL
CANT ANGLE= 2.5 DEG. CG POSITION 59.00X
V= 240. FPS RE= 0.384 MILLION

DP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 2213	-10.05	0.00	0.81	0.476	-0.204	0.014	-0.040	0.003
NR 2214	-10.05	22.50	0.76	0.184	-0.202	-0.056	0.121	0.017
NR 2215	-10.06	45.00	0.67	0.068	-0.210	-0.018	0.103	0.032
NR 2216	-10.08	67.50	0.67	0.035	-0.205	0.049	0.034	0.037
NR 2217	-10.10	90.00	0.70	0.041	-0.200	0.060	0.069	0.038
NR 2222	-5.02	0.00	0.37	0.064	-0.188	-0.003	-0.001	-0.003
NR 2221	-5.03	22.50	0.34	0.044	-0.197	-0.006	0.045	0.012
NR 2220	-5.04	45.00	0.31	0.001	-0.195	0.009	0.076	0.030
NR 2219	-5.05	67.50	0.29	-0.039	-0.195	0.034	0.069	0.038
NR 2218	-5.07	90.00	0.30	-0.059	-0.195	0.040	0.073	0.041
NR 2223	0.00	0.00	-0.01	0.022	-0.182	0.000	-0.008	-0.005
NR 2224	0.00	22.50	-0.04	0.014	-0.181	-0.013	0.016	0.012
NR 2225	-0.01	45.00	-0.05	0.001	-0.180	0.004	0.049	0.026
NR 2226	-0.03	67.50	-0.06	-0.026	-0.179	0.009	0.058	0.036
NR 2227	-0.05	90.00	-0.06	-0.053	-0.184	0.030	0.067	0.039
NR 2232	5.02	-0.01	-0.34	0.068	-0.200	0.023	-0.018	-0.009
NR 2231	5.02	22.49	-0.34	0.068	-0.199	0.008	-0.008	0.002
NR 2230	5.01	45.00	-0.36	0.058	-0.193	-0.011	0.076	0.024
NR 2229	5.00	67.50	-0.40	-0.002	-0.198	-0.013	0.094	0.035
NR 2228	4.98	90.00	-0.42	-0.063	-0.203	0.020	0.069	0.037
NR 2233	10.05	-0.01	-0.72	-0.020	-0.198	0.012	-0.001	-0.011
NR 2234	10.05	22.49	-0.71	0.020	-0.203	0.015	-0.021	0.007
NR 2235	10.04	45.00	-0.71	0.031	-0.208	-0.042	0.079	0.022
NR 2236	10.02	67.50	-0.76	-0.064	-0.207	-0.077	0.177	0.033
NR 2237	10.01	90.00	-0.81	-0.186	-0.212	-0.020	0.090	0.036
NR 2242	15.08	-0.01	-1.19	-0.281	-0.199	-0.005	0.012	-0.016
NR 2241	15.08	22.49	-1.15	-0.177	-0.194	0.056	-0.119	0.002
NR 2240	15.07	45.00	-1.11	-0.105	-0.193	-0.051	0.124	0.023
NR 2239	15.06	67.50	-1.19	-0.244	-0.193	-0.135	0.294	0.033
NR 2238	15.04	90.00	-1.29	-0.448	-0.213	-0.050	0.129	0.036
NR 2243	20.11	-0.01	-1.72	-0.629	-0.181	-0.016	0.034	-0.023
NR 2244	20.11	22.50	-1.59	-0.402	-0.167	0.093	-0.192	0.011
NR 2245	20.10	44.99	-1.57	-0.352	-0.162	-0.054	0.106	0.008
NR 2246	20.09	67.49	-1.62	-0.440	-0.186	-0.207	0.376	0.015
NR 2247	20.08	90.00	-1.83	-0.802	-0.210	-0.070	0.155	0.031
NR 2254	25.15	-0.02	-2.28	-0.971	-0.142	-0.017	0.063	-0.035
NR 2252	25.13	22.56	-1.96	-0.463	-0.201	-0.011	-0.032	0.107
NR 2253	25.13	22.56	-1.96	-0.463	-0.206	-0.011	-0.032	0.109
NR 2251	25.13	44.98	-2.00	-0.600	-0.147	-0.079	0.123	0.001
NR 2249	25.12	67.41	-1.97	-0.502	-0.246	-0.028	0.049	-0.113
NR 2250	25.12	67.41	-1.97	-0.505	-0.251	-0.031	0.063	-0.113
NR 2248	25.12	89.99	-2.37	-1.108	-0.195	-0.110	0.196	0.022
NR 2255	29.18	-0.08	-2.62	-1.001	-0.167	0.110	-0.134	-0.133
NR 2256	29.16	22.59	-2.30	-0.616	-0.225	-0.122	0.184	0.164

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E 3FT*4FT TUNNEL RESULTS.

DP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 2257	29.15	44.98	-2.30	-0.663	-0.152	-0.080	0.143	-0.012
NR 2258	29.14	67.38	-2.29	-0.681	-0.256	0.021	-0.027	-0.163
NR 2259	29.13	89.95	-2.40	-0.826	-0.202	-0.012	0.041	-0.046
NR 2260	29.13	89.95	-2.34	-0.823	-0.202	-0.022	0.018	-0.042
NR 2212	0.00	0.00	-0.01	0.030	-0.187	0.001	-0.024	-0.003
NR 2261	0.00	0.10	-0.01	0.053	-0.187	0.010	-0.009	0.002

(Run.28)

RUN NUMBER=28 LOWD BODY, ROUND NOSE, SMALL TAIL,
CANT ANGLE= 5.0 CG POSITION 50.00X
V= 240, FPS RE= 0.584 MILLION

DP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 2059	-10.05	0.00	0.89	0.404	-0.229	0.008	-0.006	0.006
NR 2060	-10.06	22.50	0.82	0.517	-0.227	-0.082	0.191	0.016
NR 2061	-10.06	45.00	0.72	0.508	-0.255	-0.072	0.580	0.027
NR 2061	-10.06	45.00	0.72	0.142	-0.255	-0.075	0.220	0.027
NR 2062	-10.08	67.50	0.68	0.040	-0.224	0.001	0.126	0.052
NR 2065	-10.10	90.00	0.68	0.017	-0.210	0.010	0.126	0.055
NR 2064	-5.08	90.00	0.56	-0.079	-0.199	-0.000	0.121	0.035
NR 2065	-5.06	67.50	0.57	-0.029	-0.199	-0.019	0.144	0.032
NR 2066	-5.04	45.00	0.41	0.050	-0.200	-0.042	0.166	0.026
NR 2067	-5.05	22.50	0.47	0.157	-0.201	-0.045	0.152	0.015
NR 2068	-5.05	0.10	0.51	0.202	-0.198	0.001	0.021	0.000
NR 2069	0.00	0.10	0.04	0.110	-0.206	-0.002	0.014	-0.002
NR 2070	0.00	22.50	0.01	0.095	-0.210	-0.052	0.072	0.015
NR 2071	-0.01	45.00	-0.01	0.042	-0.209	-0.058	0.111	0.024
NR 2072	-0.03	67.50	-0.04	-0.009	-0.209	-0.057	0.158	0.012
NR 2073	-0.05	90.00	-0.06	-0.068	-0.209	-0.020	0.131	0.035
NR 2078	5.02	-0.01	-0.29	0.147	-0.219	0.010	0.005	-0.010
NR 2077	5.02	22.50	-0.50	0.154	-0.218	-0.029	0.068	0.011
NR 2076	5.01	45.00	-0.34	0.098	-0.218	-0.055	0.138	0.026
NR 2075	5.00	67.50	-0.59	0.001	-0.222	-0.055	0.162	0.034
NR 2074	4.98	90.00	-0.42	-0.078	-0.227	-0.040	0.155	0.057
NR 2079	10.05	-0.01	-0.67	0.098	-0.208	-0.006	0.014	-0.010
NR 2080	10.04	22.50	-0.66	0.122	-0.218	-0.020	0.045	0.011
NR 2081	10.04	45.00	-0.68	0.082	-0.252	-0.091	0.174	0.025
NR 2082	10.05	67.50	-0.77	-0.072	-0.252	-0.112	0.241	0.035
NR 2083	10.01	90.00	-0.85	-0.211	-0.242	-0.060	0.154	0.035
NR 2088	15.08	0.09	-1.12	-0.159	-0.204	-0.017	0.026	-0.014
NR 2087	15.07	22.50	-1.07	-0.041	-0.209	0.016	-0.056	0.008
NR 2086	15.06	45.00	-1.08	-0.042	-0.218	-0.129	0.245	0.024
NR 2085	15.06	67.50	-1.20	-0.267	-0.222	-0.205	0.566	0.051
NR 2084	15.05	90.00	-1.52	-0.497	-0.242	-0.080	0.186	0.039
NR 2089	20.11	0.09	-1.64	-0.471	-0.166	-0.028	0.055	-0.017
NR 2090	20.10	22.51	-1.55	-0.264	-0.167	0.086	-0.181	0.028
NR 2091	20.10	44.99	-1.54	-0.279	-0.186	-0.114	0.100	0.014
NR 2092	20.09	67.48	-1.65	-0.446	-0.210	-0.284	0.509	0.002
NR 2095	20.08	90.00	-1.85	-0.842	-0.254	-0.120	0.197	0.051
NR 2102	25.15	-0.02	-2.22	-0.857	-0.152	-0.075	0.095	-0.026
NR 2105	25.13	22.55	-1.94	-0.558	-0.182	0.058	-0.122	0.101
NR 2104	25.15	44.99	-2.00	-0.489	-0.152	-0.145	0.255	0.005
NR 2095	25.12	67.40	-1.98	-0.474	-0.281	-0.077	0.156	-0.127
NR 2105	25.12	67.40	-1.98	-0.469	-0.266	-0.068	0.150	-0.126
NR 2094	25.12	89.99	-2.40	-1.157	-0.215	-0.140	0.250	0.018
NR 2106	25.12	89.99	-2.40	-1.164	-0.215	-0.120	0.252	0.025
NR 2112	29.18	-0.05	-2.66	-1.089	-0.087	-0.078	0.116	-0.045

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E 5FT-4FT TUNNEL RESULTS.

DP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 2111	29.16	22.60	-2.28	-0.478	-0.210	-0.165	0.207	0.172
NR 2110	29.15	44.96	-2.50	-0.592	-0.155	-0.127	0.226	-0.041
NR 2109	29.14	67.38	-2.35	-0.667	-0.246	-0.052	0.112	-0.164
NR 2107	29.15	89.97	-2.58	-0.792	-0.207	-0.071	0.105	-0.066
NR 2108	29.15	89.98	-2.59	-0.792	-0.212	-0.071	0.118	-0.005
NR 2057	0.01	0.00	0.00	0.692	0.000	0.000	-0.011	0.001
NR 2058	0.00	0.00	0.05	0.109	-0.211	-0.006	0.014	-0.001
NR 2096	0.00	0.00	0.04	0.110	-0.206	-0.006	0.014	0.001
NR 2101	0.00	0.00	0.05	0.102	-0.206	-0.015	0.015	0.001
NR 2115	0.00	0.00	0.05	0.117	-0.206	-0.001	0.022	0.005
NR 2114	0.00	0.00	0.05	0.117	-0.206	-0.001	0.030	0.005

(Run.7)

RUN NUMBER=7 LONG BODY, ROUND NOSE, SMALL TAIL
CANT ANGLE=10.0 CB POSITION 50.00X
V= 240, FPS RE= 0.384 MILLION

DP.NO.	ATTITUDE		COEFFICIENTS					
	THETA	PHI	C2	CM	CX	CY	CN	CL
NR 558	-10.06	0.00	1.05	0.723	-0.278	0.042	-0.069	0.007
NR 559	-10.06	22.50	0.98	0.633	-0.288	-0.106	0.363	0.018
NR 560	-10.07	45.00	0.86	0.616	-0.286	-0.137	0.402	0.029
NR 561	-10.08	67.50	0.75	0.176	-0.289	-0.123	0.339	0.030
NR 562	-10.10	89.99	0.69	0.066	-0.289	-0.090	0.323	0.030
NR 567	-5.0E	0.00	0.56	0.461	-0.262	0.031	-0.060	0.000
NR 566	-5.04	22.50	0.53	0.383	-0.261	-0.039	0.170	0.019
NR 565	-5.04	45.00	0.44	0.348	-0.269	-0.134	0.302	0.024
NR 564	-5.06	67.50	0.36	0.068	-0.266	-0.120	0.333	0.031
NR 563	-5.07	89.99	0.31	-0.062	-0.236	-0.130	0.319	0.032
NR 568	-0.01	0.00	0.14	0.263	-0.231	0.026	-0.014	-0.001
NR 569	-0.01	22.50	0.11	0.258	-0.230	-0.066	0.110	0.018
NR 570	-0.02	45.00	0.08	0.190	-0.226	-0.094	0.308	0.028
NR 571	-0.03	67.50	0.02	0.091	-0.238	-0.120	0.366	0.038
NR 572	-0.03	90.00	-0.03	-0.023	-0.238	-0.160	0.330	0.037
NR 577	5.02	0.00	-0.20	0.382	-0.226	0.023	-0.014	-0.003
NR 576	5.02	22.50	-0.22	0.273	-0.232	-0.032	0.088	0.016
NR 575	5.01	45.00	-0.25	0.212	-0.222	-0.084	0.191	0.036
NR 574	4.99	67.50	-0.21	0.103	-0.232	-0.130	0.372	0.041
NR 573	4.98	90.00	-0.38	-0.009	-0.262	-0.160	0.313	0.043
NR 578	10.04	0.00	-0.53	0.313	-0.213	0.020	-0.014	-0.007
NR 579	10.04	22.50	-0.53	0.320	-0.223	-0.030	0.079	0.019
NR 580	10.02	45.00	-0.58	0.238	-0.222	-0.112	0.262	0.036
NR 581	10.02	67.50	-0.71	0.055	-0.232	-0.175	0.331	0.043
NR 582	10.01	90.00	-0.81	-0.142	-0.242	-0.130	0.336	0.043
NR 587	15.07	-0.01	-0.98	0.197	-0.196	-0.045	-0.036	-0.009
NR 588	15.07	22.50	-0.94	0.253	-0.186	-0.019	-0.009	0.019
NR 589	15.06	45.00	-0.99	0.166	-0.208	-0.185	0.332	0.022
NR 590	15.05	67.50	-1.15	-0.131	-0.233	-0.268	0.676	0.042
NR 591	15.05	90.00	-1.29	-0.413	-0.262	-0.160	0.330	0.042
NR 596	20.11	-0.01	-1.51	-0.158	-0.127	-0.069	0.013	-0.022
NR 595	20.10	22.50	-1.58	0.063	-0.138	0.034	-0.139	0.016
NR 594	20.09	45.00	-1.40	0.020	-0.167	-0.209	0.335	0.022
NR 593	20.09	67.49	-1.57	-0.295	-0.208	-0.535	0.613	0.021
NR 592	20.08	90.00	-1.81	-0.768	-0.233	-0.210	0.384	0.043
NR 597	25.14	-0.02	-2.06	-0.316	-0.078	-0.072	0.098	-0.033
NR 598	25.13	22.50	-1.80	-0.166	-0.096	0.033	-0.130	0.017
NR 599	25.12	44.99	-1.83	-0.205	-0.128	-0.203	0.303	0.008
NR 600	25.11	67.42	-1.92	-0.253	-0.267	-0.214	0.350	-0.096
NR 601	25.11	89.91	-2.19	-0.742	-0.320	-0.063	0.086	-0.106
NR 606	29.18	-0.03	-2.57	-0.826	-0.039	-0.137	0.090	-0.051
NR 605	29.15	22.55	-2.15	-0.227	-0.136	-0.033	-0.173	0.095
NR 604	29.15	44.96	-2.19	-0.310	-0.116	-0.215	0.252	-0.022
NR 603	29.14	67.40	-2.50	-0.501	-0.262	-0.132	0.194	-0.156

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLITE = R.A.E 397-4FT TUNNEL RESULTS.

DP.NO.	ATTITUDE		COEFFICIENTS					
	THETA	PHI	C2	CM	CX	CY	CN	CL
NR 602	29.13	89.91	-2.41	-0.779	-0.256	-0.074	0.050	-0.106
NR 557	-0.01	0.00	0.13	0.290	-0.236	0.014	-0.021	0.000
NR 583	-0.01	0.00	0.13	0.290	-0.226	-0.004	-0.026	-0.001
NR 586	0.00	0.00	0.13	0.308	-0.231	0.008	-0.013	0.002
NR 607	0.00	0.00	0.10	0.396	-0.251	-0.059	-0.058	-0.003

(Run.9)

RUN NUMBER=9 LONG BODY, SQUARE NOSE, SMALL TAIL
CANT ANGLE= 0.0 DEG. CG POSITION 50.00X
V= 240, FPS RB= 0.384 MILLION

DP.NO.	ATTITUDE				COEFFICIENTS		CN	CL
	THETA	PHI	CZ	CM	CX	CY		
NR 700	-10.05	0.00	0.79	0.344	-0.887	0.019	-0.006	0.003
NR 701	-10.05	22.50	0.73	0.252	-0.899	-0.023	0.134	0.025
NR 702	-10.06	45.00	0.66	0.138	-0.909	0.037	0.052	0.039
NR 703	-10.08	67.50	0.71	0.176	-0.898	0.120	-0.062	0.043
NR 704	-10.11	90.00	0.76	0.244	-0.898	0.100	0.029	0.045
NR 709	-5.02	0.00	0.55	0.170	-0.876	0.015	-0.003	0.001
NR 708	-5.02	22.50	0.33	0.140	-0.879	0.009	0.055	0.017
NR 707	-5.04	45.00	0.29	0.110	-0.875	0.054	0.035	0.039
NR 706	-5.06	67.50	0.30	0.096	-0.877	0.059	0.045	0.049
NR 705	-5.07	90.00	0.31	0.096	-0.878	0.070	0.050	0.047
NR 710	0.00	0.00	-0.02	-0.016	-0.850	0.012	0.000	-0.002
NR 711	0.00	22.50	-0.05	-0.019	-0.843	0.011	0.040	0.022
NR 712	-0.01	45.00	-0.06	-0.046	-0.847	0.007	0.066	0.037
NR 713	-0.03	67.50	-0.07	-0.067	-0.851	0.027	0.070	0.045
NR 714	-0.05	90.00	-0.05	-0.109	-0.851	0.040	0.045	0.046
NR 719	5.02	0.00	-0.40	-0.188	-0.887	0.002	0.019	-0.002
NR 718	5.02	22.50	-0.40	-0.185	-0.891	0.006	0.024	0.016
NR 717	5.01	45.00	-0.39	-0.155	-0.890	0.004	0.054	0.035
NR 716	4.99	67.50	-0.41	-0.214	-0.894	0.012	0.095	0.049
NR 715	4.98	90.00	-0.42	-0.259	-0.899	0.030	0.062	0.048
NR 720	10.05	0.00	-0.85	-0.557	-0.915	-0.008	0.021	-0.004
NR 721	10.05	22.50	-0.81	-0.277	-0.920	0.054	-0.074	0.017
NR 722	10.06	45.00	-0.77	-0.201	-0.934	0.004	0.051	0.035
NR 723	10.02	67.50	-0.82	-0.293	-0.953	-0.057	0.184	0.044
NR 724	10.01	90.10	-0.88	-0.426	-0.953	0.002	0.085	0.049
NR 729	15.09	0.10	-1.40	-0.559	-0.955	-0.058	0.052	-0.003
NR 730	15.09	0.10	-1.40	-0.559	-0.930	-0.058	0.052	-0.003
NR 731	15.09	22.50	-1.54	-0.410	-0.940	0.066	-0.160	0.020
NR 732	15.09	22.50	-1.33	-0.423	-0.935	0.097	-0.167	0.015
NR 733	15.07	45.00	-1.27	-0.286	-0.944	-0.009	0.038	0.031
NR 734	15.07	45.00	-1.27	-0.286	-0.944	-0.002	0.058	0.029
NR 735	15.06	67.50	-1.34	-0.411	-0.944	-0.121	0.281	0.044
NR 736	15.06	67.50	-1.53	-0.417	-0.949	-0.131	0.267	0.041
NR 737	15.05	90.10	-1.43	-0.619	-0.944	-0.048	0.099	0.052
NR 738	15.05	90.10	-1.43	-0.615	-0.944	-0.038	0.098	0.048
NR 747	20.14	-0.01	-2.05	-0.741	-0.971	-0.065	0.055	-0.015
NR 748	20.14	-0.01	-2.05	-0.741	-0.971	-0.065	0.055	-0.015
NR 745	20.15	22.50	-1.96	-0.570	-0.982	0.088	-0.210	0.016
NR 746	20.15	22.60	-1.95	-0.570	-0.982	0.075	-0.211	0.026
NR 743	20.12	44.99	-1.88	-0.394	-0.962	-0.038	0.035	0.023
NR 744	20.12	45.00	-1.88	-0.394	-0.962	-0.051	0.055	0.032
NR 741	20.11	67.50	-1.94	-0.515	-0.981	-0.209	0.319	0.041
NR 742	20.11	67.49	-1.94	-0.515	-0.961	-0.209	0.319	0.052
NR 759	20.10	90.11	-2.08	-0.755	-0.971	-0.106	0.114	0.059
NR 740	20.10	90.10	-2.08	-0.755	-0.971	-0.106	0.089	0.044

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLITS • R.4.E 3FT•4FT TUNNEL RESULTS.

DP.NO.	ATTITUDE				COEFFICIENTS		CN	CL
	THETA	PHI	CZ	CM	CX	CY		
NR 749	25.18	-0.02	-2.68	-0.748	-1.045	-0.044	0.028	-0.027
NR 750	25.18	-0.02	-2.68	-0.783	-1.035	-0.056	0.029	-0.029
NR 751	25.18	22.83	-2.62	-0.647	-1.051	-0.003	-0.094	0.066
NR 752	25.18	22.83	-2.62	-0.648	-1.051	-0.008	-0.093	0.066
NR 733	25.17	45.00	-2.57	-0.562	-1.027	-0.069	0.042	0.027
NR 754	25.17	45.00	-2.57	-0.562	-1.027	-0.069	0.042	0.028
NR 755	25.16	67.45	-2.61	-0.655	-1.052	-0.172	0.190	-0.054
NR 756	25.16	67.45	-2.60	-0.640	-1.042	-0.161	0.176	-0.057
NR 757	25.15	89.99	-2.72	-0.765	-1.052	-0.120	0.057	0.053
NR 756	25.15	89.99	-2.70	-0.769	-1.061	-0.100	0.056	0.057
NR 699	0.00	0.00	-0.04	-0.002	-0.840	0.000	-0.008	0.000
NR 725	0.00	0.10	-0.05	-0.009	-0.845	0.010	-0.001	0.005
NR 726	0.00	0.10	-0.05	-0.009	-0.845	0.004	-0.016	0.003
NR 759	0.00	0.00	-0.05	-0.001	-0.854	0.000	0.000	0.003

(Run.30&30.1)

RUN NUMBER=30 LONG BODY, SQUARE NOSE, SMALL TAIL
CANT ANGLE= 2.5 DEG. CG POSITION 50.00%
V= 240. FPS RE= 0.384 MILLION

DP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 2169	-10.05	0.01	0.85	0.492	-0.902	0.033	-0.041	0.009
NR 2169	-10.05	0.01	0.86	0.723	-0.902	0.033	-0.045	0.009
NR 2170	-10.05	22.50	0.78	0.400	-0.899	-0.056	0.167	0.026
NR 2170	-10.05	22.50	0.78	0.613	-0.899	-0.056	0.252	0.026
NR 2171	-10.06	45.00	0.70	0.250	-0.903	-0.004	0.138	0.042
NR 2172	-10.08	67.50	0.70	0.222	-0.898	0.082	0.028	0.049
NR 2173	-10.10	90.00	0.76	0.261	-0.898	0.080	0.099	0.053
NR 2178	-5.02	0.00	0.38	0.279	-0.871	0.022	-0.021	0.002
NR 2177	-5.02	22.50	0.34	0.246	-0.869	-0.004	0.061	0.018
NR 2176	-5.04	45.00	0.31	0.166	-0.873	0.013	0.097	0.038
NR 2175	-5.05	67.50	0.30	0.117	-0.872	0.047	0.094	0.053
NR 2174	-5.07	90.00	0.31	0.105	-0.873	0.050	0.128	0.055
NR 2179	0.00	0.00	-0.02	0.052	-0.840	0.013	-0.025	0.001
NR 2180	0.00	22.50	-0.03	0.048	-0.838	-0.001	0.041	0.023
NR 2181	-0.01	45.00	-0.06	0.017	-0.837	0.001	0.092	0.039
NR 2182	-0.03	67.50	-0.06	-0.039	-0.837	0.006	0.117	0.046
NR 2183	-0.05	90.00	-0.07	-0.089	-0.842	0.020	0.135	0.048
NR 2184	5.02	-0.01	-0.36	-0.102	-0.882	0.016	-0.007	-0.024
NR 2188	5.02	22.49	-0.37	-0.079	-0.871	-0.005	0.049	0.010
NR 2187	5.01	45.00	-0.38	-0.087	-0.875	-0.014	0.108	0.038
NR 2186	4.99	67.50	-0.41	-0.171	-0.879	-0.008	0.153	0.049
NR 2185	5.00	64.60	-0.41	-0.178	-0.884	0.036	0.153	0.048
NR 2184	4.98	90.00	-0.43	-0.211	-0.884	0.020	0.131	0.048
NR 2190	10.05	-0.01	-0.78	-0.216	-0.901	-0.007	0.011	-0.009
NR 2191	10.05	22.50	-0.76	-0.151	-0.905	0.021	-0.049	0.013
NR 2192	10.04	45.00	-0.75	-0.110	-0.914	-0.033	0.116	0.031
NR 2193	10.02	67.50	-0.82	-0.244	-0.913	-0.089	0.240	0.043
NR 2194	10.01	90.00	-0.88	-0.394	-0.918	-0.010	0.130	0.048
NR 2203	15.09	-0.01	-1.31	-0.412	-0.916	-0.018	0.014	-0.012
NR 2204	15.09	-0.01	-1.31	-0.420	-0.916	-0.012	0.006	-0.017
NR 2201	15.08	22.50	-1.26	-0.284	-0.916	0.056	-0.136	0.014
NR 2202	15.08	22.50	-1.27	-0.284	-0.916	0.051	-0.136	0.015
NR 2199	15.07	45.00	-1.23	-0.179	-0.935	-0.066	0.132	0.035
NR 2200	15.07	45.00	-1.22	-0.163	-0.935	-0.074	0.137	0.040
NR 2197	15.06	67.50	-1.31	-0.361	-0.934	-0.165	0.354	0.047
NR 2198	15.06	67.50	-1.31	-0.361	-0.934	-0.165	0.354	0.044
NR 2195	15.05	90.00	-1.43	-0.582	-0.934	-0.060	0.161	0.054
NR 2196	15.05	90.00	-1.43	-0.582	-0.934	-0.070	0.161	0.046
NR 2205	20.13	-0.01	-1.97	-0.584	-0.932	-0.055	0.027	-0.013
NR 2206	20.13	0.00	-1.97	-0.576	-0.932	-0.069	0.051	-0.007
NR 2207	20.13	22.49	-1.89	-0.414	-0.943	0.064	-0.201	0.009
NR 2208	20.13	22.50	-1.89	-0.404	-0.943	0.058	-0.204	0.014
NR 2168	0.00	0.00	-0.01	0.060	-0.840	0.013	-0.026	-0.001
NR 2209	0.00	0.00	0.00	0.045	-0.845	0.019	-0.026	0.003
NR 2210	0.00	0.00	0.00	0.023	-0.000	0.000	-0.000	0.005

RUN NUMBER=30.1 LONG BODY, SQUARE NOSE, SMALL TAIL
CANT ANGLE= 2.5 DEG. CG POSITION 50.00%
V= 240. FPS RE= 0.384 MILLION

DP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 3523	20.13	-0.01	-1.97	-0.562	-0.937	-0.018	0.008	-0.013
NR 3524	20.13	-0.01	-1.97	-0.546	-0.932	-0.024	0.016	-0.016
NR 3525	20.13	22.50	-1.88	-0.384	-0.943	0.098	-0.191	0.011
NR 3526	20.13	22.49	-1.88	-0.387	-0.948	0.098	-0.183	0.007
NR 3527	20.12	45.00	-1.82	-0.275	-0.962	-0.062	0.136	0.027
NR 3528	20.12	45.00	-1.81	-0.275	-0.962	-0.074	0.125	0.027
NR 3529	20.11	67.49	-1.92	-0.465	-0.972	-0.234	0.434	0.034
NR 3530	20.11	67.49	-1.92	-0.474	-0.967	-0.234	0.413	0.031
NR 3531	20.10	90.00	-2.07	-0.743	-0.971	-0.130	0.193	0.047
NR 3532	20.10	90.00	-2.07	-0.727	-0.971	-0.160	0.217	0.050
NR 3541	25.18	-0.02	-2.65	-0.643	-0.996	-0.135	0.007	-0.036
NR 3542	25.18	-0.02	-2.65	-0.667	-0.991	-0.061	0.004	-0.030
NR 3539	25.18	22.52	-2.58	-0.514	-0.982	-0.032	-0.092	0.042
NR 3540	25.18	22.51	-2.58	-0.505	-0.982	-0.004	-0.115	0.040
NR 3538	25.17	44.99	-2.53	-0.472	-0.988	-0.128	0.131	0.018
NR 3535	25.16	67.45	-2.59	-0.592	-1.027	-0.188	0.324	-0.033
NR 3536	25.16	67.46	-2.59	-0.575	-1.027	-0.220	0.326	-0.030
NR 3533	25.15	90.00	-2.70	-0.778	-1.047	-0.170	0.190	0.038
NR 3534	25.15	89.99	-2.70	-0.786	-1.047	-0.160	0.179	0.029
NR 3543	28.20	-0.03	-2.99	-0.810	-1.031	-0.051	-0.059	-0.041
NR 3544	28.20	-0.03	-3.00	-0.803	-1.027	-0.050	-0.091	-0.042
NR 3545	28.20	22.52	-2.95	-0.644	-1.017	-0.032	-0.101	0.052
NR 3546	28.20	22.52	-2.95	-0.651	-1.018	-0.059	-0.102	0.052
NR 3547	28.19	44.98	-2.86	-0.561	-0.999	-0.163	0.120	0.001
NR 3548	28.19	44.98	-2.87	-0.572	-0.999	-0.167	0.098	-0.005
NR 3549	28.19	67.44	-2.97	-0.735	-1.048	-0.160	0.202	-0.054
NR 3550	28.19	67.44	-2.96	-0.728	-1.048	-0.178	0.217	-0.059
NR 3551	28.18	89.99	-3.07	-0.887	-1.067	-0.131	0.146	0.035
NR 3552	28.18	89.99	-3.08	-0.895	-1.072	-0.161	0.193	0.032
NR 3553	0.00	0.00	0.00	0.053	-0.845	0.007	-0.017	-0.001

(Run.30.A)

RUN NUMBER=30.A LONG BODY, SQUARE NOSE, SMALL TAIL
CANT ANGLE= 2.5 DEG. CG POSITION 50.00%
V= 240. FPS RE= 0.384 MILLION

DP.NO.	ATTITUDE		COEFFICIENTS					
	THETA	PNT	CZ	CM	CX	CY	CN	CL
NR 2395	10.05	0.09	-0.78	-0.215	-0.901	-0.002	0.019	-0.009
NR 2396	10.05	0.09	-0.77	-0.207	-0.896	-0.002	0.019	-0.009
NR 2397	10.05	22.50	-0.76	-0.145	-0.900	0.026	-0.022	0.014
NR 2398	10.05	22.50	-0.76	-0.159	-0.900	0.026	-0.028	0.017
NR 2399	10.04	45.00	-0.75	-0.110	-0.914	-0.040	0.139	0.032
NR 2400	10.04	45.00	-0.74	-0.110	-0.909	-0.047	0.139	0.032
NR 2401	10.02	67.50	-0.81	-0.266	-0.913	-0.087	0.267	0.044
NR 2402	10.02	67.50	-0.81	-0.259	-0.913	-0.086	0.264	0.042
NR 2403	10.01	90.10	-0.88	-0.425	-0.913	-0.018	0.138	0.048
NR 2404	10.01	90.10	-0.88	-0.410	-0.913	-0.018	0.122	0.047
NR 2413	15.09	-0.01	-1.32	-0.405	-0.906	-0.012	0.022	-0.011
NR 2414	15.09	-0.01	-1.32	-0.397	-0.901	-0.025	0.023	-0.013
NR 2411	15.08	22.50	-1.26	-0.289	-0.911	0.056	-0.121	0.014
NR 2412	15.08	22.49	-1.26	-0.272	-0.911	0.056	-0.122	0.009
NR 2409	15.07	45.00	-1.23	-0.190	-0.930	-0.067	0.155	0.035
NR 2410	15.07	45.00	-1.23	-0.185	-0.925	-0.066	0.149	0.028
NR 2407	15.06	67.50	-1.32	-0.377	-0.929	-0.168	0.361	0.043
NR 2408	15.06	67.50	-1.32	-0.379	-0.934	-0.170	0.354	0.044
NR 2405	15.05	90.10	-1.43	-0.606	-0.934	-0.067	0.138	0.047
NR 2406	15.05	90.10	-1.43	-0.598	-0.934	-0.057	0.153	0.047
NR 2415	20.13	-0.01	-1.97	-0.584	-0.932	-0.031	0.033	-0.017
NR 2416	20.13	-0.01	-1.97	-0.584	-0.927	-0.031	0.033	-0.020
NR 2417	20.13	22.49	-1.88	-0.416	-0.943	0.107	-0.195	0.002
NR 2418	20.13	22.50	-1.88	-0.405	-0.933	0.086	-0.181	0.015
NR 2419	20.12	44.99	-1.82	-0.303	-0.952	-0.078	0.099	0.020
NR 2420	20.12	45.00	-1.83	-0.286	-0.952	-0.075	0.115	0.030
NR 2421	20.11	67.50	-1.92	-0.474	-0.967	-0.234	0.412	0.039
NR 2422	20.11	67.50	-1.93	-0.465	-0.962	-0.236	0.417	0.035
NR 2423	40.10	90.00	-2.08	-0.744	-0.962	-0.130	0.162	0.054
NR 2424	40.10	90.00	-2.09	-0.736	-0.962	-0.130	0.185	0.050
NR 2394	0.00	0.10	0.00	0.046	-0.840	0.011	-0.009	-0.002
NR 2425	0.00	0.00	-0.01	0.038	-0.840	0.006	-0.009	0.000

(Run.29)

RUN NUMBER=29 LONG BODY, SQUARE NOSE, SMALL TAIL
CANT ANGLE= 5.0 CG POSITION 50.00%
V= 240. FPS RE= 0.384 MILLION

OP.NO.	ATTITUDE		COEFFICIENTS						
	THETA	PHI	CZ	CM	CX	CY	CN	CL	
NR	2118	-10.05	0.01	0.93	0.635	-0.911	0.008	-0.018	0.015
NR	2119	-10.05	0.01	0.93	0.643	-0.916	0.014	-0.002	0.017
NR	2120	-10.06	22.51	0.85	0.525	-0.914	-0.098	0.235	0.028
NP	2121	-10.06	22.51	0.85	0.522	-0.914	-0.098	0.242	0.029
NP	2122	-10.06	45.01	0.74	0.313	-0.913	-0.051	0.233	0.043
NR	2123	-10.06	45.00	0.74	0.318	-0.908	-0.051	0.249	0.040
NR	2124	-10.08	67.50	0.72	0.218	-0.902	0.038	0.099	0.040
NR	2125	-10.08	67.50	0.72	0.228	-0.902	0.039	0.103	0.038
NP	2126	-10.11	90.00	0.77	0.231	-0.898	0.020	0.156	0.048
NR	2127	-10.11	90.00	0.77	0.231	-0.898	0.020	0.148	0.048
NR	2132	-5.03	0.00	0.46	0.360	-0.886	0.034	0.017	0.004
NR	2131	-5.03	22.50	0.40	0.324	-0.874	-0.016	0.124	0.023
NR	2130	-5.04	45.00	0.36	0.213	-0.878	-0.025	0.163	0.039
NR	2129	-5.06	67.50	0.33	0.135	-0.877	0.006	0.174	0.050
NP	2128	-5.08	90.00	0.32	0.082	-0.877	0.010	0.169	0.050
NR	2133	0.00	0.00	0.03	0.078	-0.854	0.025	0.005	0.001
NR	2134	0.00	22.50	0.01	0.067	-0.853	-0.006	0.082	0.021
NR	2135	-0.02	45.00	-0.01	0.074	-0.852	-0.026	0.163	0.038
NR	2136	-0.03	67.50	-0.05	-0.042	-0.851	-0.033	0.171	0.045
NR	2137	-0.05	90.00	-0.07	-0.112	-0.851	-0.030	0.176	0.051
NR	2142	5.02	0.00	-0.31	-0.030	-0.882	-0.004	0.024	-0.003
NP	2141	5.02	22.50	-0.32	-0.043	-0.886	-0.024	0.090	0.015
NR	2140	5.01	45.00	-0.35	-0.080	-0.885	-0.043	0.159	0.034
NR	2139	4.99	67.50	-0.40	-0.167	-0.889	-0.036	0.203	0.051
NR	2138	4.98	90.00	-0.44	-0.266	-0.894	-0.020	0.180	0.054
NR	2143	10.05	0.00	-0.74	-0.113	-0.906	-0.026	0.026	-0.003
NP	2144	10.05	22.50	-0.72	-0.061	-0.910	-0.010	0.021	0.021
NR	2145	10.04	45.00	-0.73	-0.071	-0.919	-0.082	0.200	0.042
NR	2146	10.02	67.50	-0.81	-0.259	-0.923	-0.143	0.325	0.048
NR	2147	10.01	90.00	-0.92	-0.435	-0.923	-0.070	0.187	0.054
NP	2152	15.09	0.00	-1.27	-0.295	-0.911	-0.055	0.022	-0.007
NR	2151	15.08	22.50	-1.22	-0.169	-0.921	-0.010	-0.080	0.020
NR	2150	15.07	45.00	-1.22	-0.129	-0.944	-0.144	0.228	0.040
NR	2149	15.06	67.50	-1.35	-0.386	-0.949	-0.212	0.425	0.050
NP	2148	15.05	90.00	-1.46	-0.623	-0.948	-0.110	0.203	0.054
NR	2153	20.13	0.00	-1.91	-0.435	-0.913	-0.118	0.051	-0.002
NP	2154	20.13	0.00	-1.91	-0.435	-0.918	-0.111	0.051	-0.004
NP	2155	20.12	22.50	-1.84	-0.281	-0.933	0.050	-0.131	0.018
NP	2156	20.12	22.50	-1.84	-0.275	-0.933	0.035	-0.145	0.018
NR	2158	20.12	45.00	-1.81	-0.220	-0.952	-0.128	0.182	0.038
NP	2157	20.12	45.00	-1.81	-0.225	-0.957	-0.112	0.198	0.039
NP	2159	20.11	67.50	-1.96	-0.475	-0.976	-0.281	0.499	0.038
NP	2160	20.11	67.49	-1.96	-0.474	-0.972	-0.281	0.481	0.029
NR	2161	20.11	67.50	-1.96	-0.460	-0.972	-0.283	0.493	0.036
NR	2162	20.10	90.00	-2.12	-0.769	-0.971	-0.180	0.250	0.051
NP	2163	20.10	90.01	-2.12	-0.776	-0.971	-0.180	0.277	0.062

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E 3FT*4FT TUNNEL RESULTS.

	DP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
		THETA	PHI			CX	CY		
NR	2117	-10.00	0.00	0.03	0.092	-1.023	-0.006	-0.001	0.003
NR	2165	0.00	0.00	0.02	0.093	-0.845	-0.031	0.000	0.005

(Run.29.1)

RUN NUMBER=29.1 LONG BODY, SQUARE NOSE, SMALL TAIL
CANT ANGLE= 3.0 CG POSITION 30.00X
V= 240. FPS RE= 0.384 MILLION

DP.NO.	ATTITUDE			COEFFICIENTS			CN	CL
	THETA	PHI	CZ	CM	CX	CY		
NR 3338	20.13	-0.01	-1.91	-0.433	-0.922	-0.049	0.040	-0.010
NR 3339	20.13	-0.01	-1.91	-0.433	-0.923	-0.049	0.032	-0.017
NR 3360	20.12	22.30	-1.81	-0.233	-0.938	0.039	-0.112	0.014
NR 3361	20.12	22.30	-1.82	-0.263	-0.943	0.020	-0.088	0.021
NR 3362	20.12	43.00	-1.80	-0.202	-0.962	-0.127	0.233	0.031
NR 3363	20.11	43.00	-1.79	-0.208	-0.962	-0.117	0.223	0.028
NR 3364	20.11	67.49	-1.93	-0.488	-0.976	-0.270	0.304	0.028
NR 3365	20.11	67.49	-1.93	-0.483	-0.981	-0.281	0.512	0.031
NR 3366	40.10	90.01	-2.09	-0.784	-0.981	-0.210	0.244	0.037
NR 3367	40.10	90.01	-2.09	-0.773	-0.981	-0.220	0.267	0.057
NR 3376	23.18	-0.01	-2.61	-0.610	-0.971	-0.061	0.027	-0.023
NR 3377	23.18	-0.01	-2.60	-0.603	-0.967	-0.060	0.003	-0.024
NR 3374	23.17	22.30	-2.33	-0.464	-0.963	-0.033	-0.088	0.018
NR 3375	23.17	22.31	-2.33	-0.463	-0.938	-0.029	-0.090	0.028
NR 3372	23.16	44.99	-2.46	-0.363	-0.983	-0.174	0.212	0.020
NR 3373	23.17	44.99	-2.47	-0.386	-0.988	-0.184	0.223	0.022
NR 3370	23.16	67.46	-2.39	-0.382	-1.042	-0.233	0.432	-0.031
NR 3371	23.16	67.46	-2.60	-0.388	-1.042	-0.267	0.418	-0.023
NR 3368	23.15	90.00	-2.72	-0.826	-1.036	-0.180	0.215	0.043
NR 3369	23.15	90.00	-2.73	-0.819	-1.061	-0.190	0.223	0.037
NR 3378	28.20	-0.02	-2.93	-0.722	-1.002	-0.032	0.004	-0.033
NR 3379	28.20	-0.02	-2.93	-0.722	-0.997	-0.032	-0.004	-0.030
NR 3380	28.20	22.32	-2.91	-0.391	-0.993	-0.033	-0.062	0.048
NR 3381	28.20	22.32	-2.91	-0.373	-0.978	-0.032	-0.089	0.046
NR 3382	28.19	44.98	-2.84	-0.489	-0.994	-0.179	0.168	-0.003
NR 3383	28.19	44.98	-2.83	-0.466	-0.994	-0.198	0.223	-0.006
NR 3384	28.19	67.45	-2.96	-0.723	-1.038	-0.243	0.328	-0.048
NR 3385	28.19	67.44	-2.97	-0.737	-1.033	-0.239	0.300	-0.030
NR 3386	28.18	90.00	-3.09	-0.911	-1.072	-0.140	0.216	0.041
NR 3537	0.00	0.00	0.02	0.078	-0.834	-0.006	0.007	0.000

(Run.8)								
RUN NUMBER=8 LONG BODY, SQUARE NOSE, SMALL TAIL								
CANT ANGLE=10.0 CG POSITION 30.00X								
V= 240, FPS RE= 0.384 MILLION								
DP.NO.	ATTITUDE	PMI	CZ	CM	COEFFICIENTS		CN	CL
	THETA				CX	CY		
NR	013	-10.06	0.00	1.10	0.911	-0.971	0.049	-0.072
NR	014	-10.06	22.50	1.02	0.804	-0.973	-0.114	0.282
NR	015	-10.07	44.99	0.87	0.329	-0.969	-0.144	0.383
NR	016	-10.09	67.49	0.77	0.328	-0.942	-0.069	0.293
NR	017	-10.10	89.99	0.75	0.248	-0.927	-0.060	0.274
NR	022	-5.03	0.00	0.57	0.603	-0.910	0.023	-0.042
NR	021	-5.03	22.49	0.33	0.543	-0.914	-0.062	0.151
NR	020	-5.04	44.99	0.43	0.371	-0.915	-0.105	0.283
NR	019	-5.06	67.49	0.36	0.226	-0.907	-0.100	0.324
NR	018	-5.07	89.99	0.32	0.108	-0.902	-0.070	0.310
NR	023	0.00	0.00	0.10	0.212	-0.869	0.014	-0.020
NR	024	-0.01	22.50	0.07	0.206	-0.873	-0.036	0.064
NR	025	-0.02	43.00	0.03	0.142	-0.872	-0.071	0.190
NR	026	-0.03	67.50	-0.01	0.043	-0.871	-0.081	0.263
NR	027	-0.03	90.00	-0.05	-0.070	-0.871	-0.080	0.292
NR	032	5.02	0.00	-0.24	0.103	-0.902	0.011	-0.018
NR	031	5.01	22.30	-0.26	0.080	-0.906	-0.043	0.102
NR	030	5.00	43.00	-0.29	0.033	-0.910	-0.078	0.202
NR	029	4.99	67.30	-0.36	-0.080	-0.909	-0.095	0.383
NR	028	4.98	90.00	-0.42	-0.215	-0.914	-0.090	0.320
NR	033	10.04	0.00	-0.60	0.108	-0.920	0.007	-0.003
NR	034	10.04	22.50	-0.60	0.120	-0.923	-0.031	0.060
NR	035	10.03	45.00	-0.64	0.071	-0.934	-0.113	0.269
NR	036	10.02	66.50	-0.75	-0.128	-0.938	-0.174	0.411
NR	037	10.01	90.00	-0.86	-0.337	-0.943	-0.130	0.334
NR	056	15.08	-0.01	-1.10	0.036	-0.921	-0.004	0.015
NR	057	15.08	-0.01	-1.10	0.036	-0.921	0.002	0.014
NR	058	15.07	22.50	-1.05	0.119	-0.930	0.009	0.004
NR	059	15.07	22.50	-1.03	0.118	-0.933	-0.003	0.003
NR	060	15.07	43.00	-1.08	0.066	-0.939	-0.170	0.356
NR	061	15.07	43.00	-1.08	0.066	-0.934	-0.170	0.356
NR	062	15.06	67.50	-1.24	-0.266	-0.963	-0.275	0.570
NR	063	15.06	67.50	-1.25	-0.267	-0.968	-0.278	0.571
NR	064	15.05	90.01	-1.39	-0.568	-0.968	-0.200	0.375
NR	065	15.05	90.00	-1.39	-0.568	-0.963	-0.190	0.374
NR	074	20.12	0.09	-1.75	-0.120	-0.913	-0.034	0.034
NR	075	20.12	0.09	-1.75	-0.120	-0.913	-0.035	0.050
NR	072	20.12	22.50	-1.68	0.004	-0.923	0.015	-0.080
NR	073	20.12	22.50	-1.67	0.004	-0.924	0.011	-0.080
NR	070	20.11	43.00	-1.63	0.020	-0.967	-0.184	0.342
NR	071	20.11	43.00	-1.66	0.019	-0.967	-0.199	0.343
NR	066	20.11	67.49	-1.85	-0.341	-0.991	-0.356	0.638
NR	069	20.11	67.50	-1.85	-0.341	-0.991	-0.355	0.638
NR	066	20.10	90.01	-2.04	-0.714	-0.996	-0.300	0.439
NR	067	20.10	90.00	-2.04	-0.706	-0.996	-0.290	0.438
R=RESULTS IN ROLLING BODY AXES.								
NR=RESULTS IN NON-ROLLING BODY AXES.								
WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E 3FT-6FT TUNNEL RESULTS.								
DP.NO.	ATTITUDE	PMI	CZ	CM	COEFFICIENTS		CN	CL
	THETA				CX	CY		
NR	076	25.17	0.09	-2.50	-0.381	-0.912	-0.068	0.110
NR	077	25.17	0.09	-2.50	-0.381	-0.917	-0.049	0.093
NR	078	25.17	22.49	-2.42	-0.249	-0.919	0.001	-0.033
NR	079	25.17	22.50	-2.41	-0.244	-0.919	-0.007	-0.024
NR	080	25.16	45.01	-2.36	-0.160	-0.973	-0.207	0.273
NR	081	25.16	45.01	-2.36	-0.160	-0.973	-0.211	0.273
NR	082	25.16	67.46	-2.52	-0.435	-1.042	-0.343	0.463
NR	083	25.16	67.46	-2.52	-0.432	-1.047	-0.343	0.473
NR	084	25.15	89.99	-2.69	-0.760	-1.046	-0.240	0.270
NR	085	25.15	89.99	-2.69	-0.760	-1.046	-0.240	0.270
NR	094	20.21	-0.01	-2.98	-0.331	-0.946	-0.037	0.080
NR	095	20.21	-0.01	-2.98	-0.331	-0.946	-0.043	0.080
NR	092	20.20	22.49	-2.91	-0.429	-0.924	-0.031	-0.102
NR	093	20.20	22.50	-2.91	-0.429	-0.929	-0.041	-0.101
NR	090	20.20	44.98	-2.84	-0.312	-0.964	-0.184	0.161
NR	091	20.19	44.99	-2.84	-0.313	-0.939	-0.207	0.163
NR	088	20.19	67.45	-3.02	-0.632	-1.037	-0.281	0.271
NR	089	20.19	67.45	-3.02	-0.632	-1.037	-0.278	0.271
NR	086	20.19	90.00	-3.16	-0.919	-1.086	-0.220	0.013
NR	087	20.18	90.00	-3.15	-0.924	-1.086	-0.220	0.005
NR	011	0.00	0.00	0.10	0.204	-0.874	0.014	-0.036
NR	038	0.00	0.00	0.09	0.227	-0.874	0.014	-0.028
NR	055	0.00	0.00	0.10	0.212	-0.874	0.026	-0.013
NR	066	0.00	0.00	0.09	0.227	-0.874	0.014	-0.020

(Run.26)

RUN NUMBER=26 SHORT BODY, ROUND NOSE, LARGE TAIL
CANT ANGLE= 2.5 CB POSITION 90.00X
V= 240. FPS R&w 0.984 MILLION

DP.NO.	ATTITUDE		COEFFICIENTS			CN	CL
	THETA	PHI	CZ	CM	CX		
NR 1907	-10.13	0.01	1.85	1.220	-0.966	0.086	0.010
NR 1908	-10.14	22.48	1.86	1.139	-0.346	-0.054	0.217
NR 1909	-10.16	44.99	1.85	1.085	-0.325	-0.085	0.236
NR 1910	-10.17	67.50	1.76	0.935	-0.520	-0.084	0.199
NR 1911	-10.19	90.00	1.70	0.899	-0.315	-0.120	0.256
NR 1916	-5.08	-0.01	1.07	0.677	-0.321	0.069	-0.008
NR 1913	-3.08	22.39	1.02	0.597	-0.517	-0.055	0.148
NR 1914	-3.09	44.99	0.94	0.492	-0.305	-0.117	0.219
NR 1913	-3.10	67.49	0.88	0.402	-0.295	-0.122	0.222
NR 1912	-3.12	89.99	0.83	0.312	-0.295	-0.150	0.254
NR 1917	-0.01	-0.01	0.14	0.121	-0.285	0.056	-0.017
NR 1918	-0.01	22.50	0.12	0.092	-0.285	-0.059	0.098
NR 1919	-0.02	43.00	0.08	0.059	-0.281	-0.105	0.171
NR 1920	-0.03	67.50	0.02	-0.037	-0.285	-0.141	0.221
NR 1921	-0.03	90.00	-0.05	-0.135	-0.285	-0.190	0.263
NR 1926	5.03	-0.01	-0.68	-0.294	-0.265	0.055	-0.039
NR 1925	3.05	22.49	-0.67	-0.287	-0.265	-0.022	0.058
NR 1924	5.04	45.00	-0.71	-0.331	-0.265	-0.141	0.199
NR 1923	3.03	67.50	-0.82	-0.475	-0.277	-0.221	0.283
NR 1922	3.03	89.99	-0.93	-0.608	-0.287	-0.220	0.290
NR 1927	10.12	0.00	-1.58	-0.880	-0.252	0.023	-0.028
NR 1928	10.11	22.49	-1.33	-0.827	-0.248	-0.020	0.005
NR 1929	10.11	44.99	-1.37	-0.855	-0.245	-0.199	0.250
NR 1930	10.10	67.50	-1.63	-0.992	-0.289	-0.305	0.383
NR 1931	10.09	89.99	-1.75	-1.147	-0.314	-0.270	0.351
NR 1936	13.13	0.01	-1.97	-1.052	-0.282	-0.017	-0.007
NR 1935	15.16	22.49	-2.13	-1.175	-0.255	-0.166	0.111
NR 1934	15.17	43.01	-2.30	-1.346	-0.219	-0.194	0.245
NR 1933	15.13	67.49	-2.01	-1.101	-0.302	-0.164	0.276
NR 1932	15.12	89.96	-1.98	-1.104	-0.346	-0.251	0.322
NR 1937	20.18	0.02	-2.23	-1.031	-0.319	-0.111	0.061
NR 1938	20.18	0.02	-2.23	-1.031	-0.314	-0.117	0.068
NR 1939	20.17	22.39	-2.24	-1.022	-0.322	-0.055	0.007
NR 1940	20.17	22.38	-2.24	-1.022	-0.319	-0.055	0.007
NR 1941	20.19	45.17	-2.62	-1.448	-0.230	-0.085	0.113
NR 1942	20.19	45.17	-2.62	-1.436	-0.245	-0.085	0.114
NR 1943	20.15	67.60	-2.21	-1.032	-0.349	-0.371	0.431
NR 1944	20.15	67.60	-2.21	-1.034	-0.349	-0.385	0.464
NR 1945	20.14	89.94	-2.19	-1.032	-0.419	-0.042	0.124
NR 1946	20.14	89.93	-2.20	-1.051	-0.415	-0.045	0.124

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANT80 FIN BOMBLETS = R.A.B. 5PT+6PT TUNNEL RESULTS.

DP.NO.	ATTITUDE		COEFFICIENTS			CN	CL
	THETA	PHI	CZ	CM	CX		
NR 1955	25.19	0.01	-2.41	-0.935	-0.398	-0.125	0.010
NR 1956	25.19	0.01	-2.41	-0.943	-0.398	-0.113	0.009
NR 1953	25.20	22.49	-2.33	-1.044	-0.324	-0.397	0.341
NR 1954	25.20	22.49	-2.33	-1.036	-0.324	-0.397	0.344
NR 1951	25.24	45.17	-3.13	-1.733	-0.183	-0.042	0.057
NR 1952	25.24	45.16	-3.14	-1.745	-0.188	-0.040	0.043
NR 1949	25.18	67.47	-2.48	-1.031	-0.381	0.052	0.073
NR 1950	25.18	67.47	-2.48	-1.020	-0.381	0.052	0.078
NR 1947	25.16	89.98	-2.47	-1.073	-0.465	-0.251	0.282
NR 1948	25.17	89.98	-2.48	-1.079	-0.465	-0.251	0.290
NR 1957	29.22	0.00	-2.79	-1.120	-0.400	-0.055	0.004
NR 1958	29.22	0.00	-2.78	-1.110	-0.405	-0.055	0.004
NR 1959	29.23	22.53	-2.81	-1.138	-0.312	-0.372	0.493
NR 1960	29.23	22.53	-2.81	-1.131	-0.312	-0.582	0.505
NR 1961	29.26	45.09	-3.44	-1.863	-0.108	-0.013	-0.013
NR 1962	29.26	45.09	-3.43	-1.867	-0.105	-0.017	-0.009
NR 1963	29.21	67.45	-2.77	-1.128	-0.351	0.129	-0.035
NR 1964	29.20	89.98	-2.87	-1.281	-0.435	-0.861	0.386
NR 1906	-0.01	-0.01	0.16	0.166	-0.275	0.053	-0.007
NR 1965	-0.01	0.00	0.15	0.167	-0.280	0.042	-0.024

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

(Run.23)

RUN NUMBER=25 SHORT BODY, ROUND NOSE, LARGE TAIL
CANTY ANGLE= 5.0 CO POSITION 50.00X
V= 240, FPS RE= 0.384 MILLION

OP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 1738	-10.14	0.00	1.88	1.258	-0.460	0.043	0.028	0.004
NR 1739	-10.14	22.60	1.89	1.250	-0.430	-0.115	0.283	0.058
NR 1740	-10.17	44.99	1.98	1.227	-0.411	-0.500	0.451	0.044
NR 1740	-10.16	44.99	1.98	1.724	-0.411	-0.500	0.955	0.045
NR 1741	-10.18	67.51	1.83	1.030	-0.379	-0.412	0.515	0.095
NR 1742	-10.18	90.00	1.66	0.856	-0.554	-0.400	0.498	0.094
NR 1747	-5.10	0.01	1.37	0.978	-0.405	0.055	-0.008	0.012
NR 1746	-5.10	22.51	1.31	0.896	-0.401	-0.205	0.295	0.046
NR 1745	-5.10	45.10	1.17	0.710	-0.385	-0.371	0.465	0.070
NR 1744	-5.11	67.50	0.99	0.488	-0.347	-0.455	0.513	0.085
NR 1745	-5.12	90.00	0.80	0.288	-0.322	-0.440	0.529	0.095
NR 1748	-0.03	0.00	0.45	0.359	-0.329	0.055	-0.001	0.007
NR 1749	-0.05	22.51	0.58	0.512	-0.527	-0.170	0.206	0.046
NR 1750	-0.04	45.01	0.28	0.201	-0.326	-0.332	0.368	0.079
NR 1751	-0.04	67.51	0.11	0.034	-0.534	-0.450	0.489	0.097
NR 1752	-0.04	90.01	-0.07	-0.160	-0.554	-0.490	0.535	0.107
NR 1757	5.03	0.01	-0.58	-0.031	-0.273	0.021	-0.012	0.011
NR 1756	5.03	22.51	-0.42	-0.065	-0.278	-0.169	0.178	0.050
NR 1755	5.03	45.11	-0.54	-0.195	-0.287	-0.356	0.575	0.080
NR 1754	5.03	67.51	-0.75	-0.419	-0.307	-0.472	0.499	0.102
NR 1755	5.03	90.01	-0.95	-0.624	-0.556	-0.520	0.552	0.109
NR 1758	10.10	0.01	-1.28	-0.579	-0.208	0.007	-0.011	0.010
NR 1759	10.10	22.51	-1.28	-0.557	-0.219	-0.185	0.170	0.055
NR 1760	10.10	45.11	-1.58	-0.682	-0.255	-0.473	0.511	0.082
NR 1761	10.10	67.52	-1.57	-0.927	-0.509	-0.562	0.605	0.116
NR 1762	10.09	90.01	-1.77	-1.175	-0.553	-0.560	0.591	0.111
NR 1767	15.15	0.07	-1.97	-1.037	-0.199	0.015	-0.016	-0.047
NR 1766	15.15	22.48	-2.04	-1.061	-0.167	-0.205	0.181	0.008
NR 1765	15.15	45.04	-2.09	-1.118	-0.208	-0.458	0.509	0.132
NR 1764	15.13	67.52	-1.94	-1.039	-0.316	-0.447	0.540	0.110
NR 1763	15.11	89.99	-1.96	-1.101	-0.390	-0.530	0.565	0.065
NR 1768	20.18	0.09	-2.26	-1.049	-0.226	-0.029	0.002	-0.015
NR 1769	20.17	22.55	-2.25	-1.015	-0.220	-0.144	0.098	-0.204
NR 1770	20.17	22.56	-2.24	-1.017	-0.215	-0.150	0.104	-0.199
NR 1771	20.18	45.21	-2.37	-1.155	-0.250	-0.576	0.418	0.410
NR 1772	20.15	67.62	-2.10	-0.929	-0.584	-0.659	0.694	0.284
NR 1773	20.13	89.98	-2.14	-1.011	-0.458	-0.561	0.598	0.060
NR 1774	20.13	89.98	-2.14	-1.003	-0.458	-0.581	0.418	0.060
NR 1779	25.20	-0.03	-2.47	-0.990	-0.270	0.085	-0.104	-0.051
NR 1780	25.20	-0.03	-2.47	-0.998	-0.265	0.059	-0.086	-0.043
NR 1778	25.21	22.40	-2.61	-1.156	-0.201	-0.193	0.142	-0.156
NR 1777	25.22	45.22	-2.94	-1.502	-0.139	-0.368	0.576	0.422
NR 1776	25.18	67.51	-2.42	-0.969	-0.381	-0.287	0.579	0.099
NR 1775	25.16	90.02	-2.42	-1.040	-0.504	-0.489	0.511	0.124

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS = R.4.E 5PT-4PT TUNNEL RESULTS.

OP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 1781	29.21	-0.01	-2.66	-0.994	-0.341	-0.029	-0.007	-0.020
NR 1782	29.22	22.51	-2.74	-1.071	-0.233	-0.555	0.489	0.045
NR 1783	29.26	45.17	-3.55	-1.741	-0.044	-0.284	0.272	0.329
NR 1784	29.21	67.49	-2.74	-1.094	-0.521	-0.149	0.260	0.058
NR 1785	29.19	90.03	-2.77	-1.199	-0.479	-0.449	0.490	0.127
NR 1737	-0.03	0.00	0.45	0.594	-0.519	0.033	0.015	0.000
NR 1757	-0.03	0.00	0.45	0.623	-0.519	0.055	0.011	0.000
NR 1786	-0.05	0.01	0.44	0.584	-0.524	0.027	0.015	0.014

(Run.11)

RUN NUMBER=11 SHORT BODY, ROUND NOSE, LARGE TAIL
CANT ANGLE=10.0 C4 POSITION 90.00X
V= 240, FPS RE= 0.384 MILLION

OP. NO.	ATTITUDE		C2	C4	COEFFICIENTS		C4	CL
	THETA	PHI			CX	CY		
NR 857	-10.13	0.00	1.81	1.164	-0.572	0.062	0.027	-0.002
NR 858	-10.13	0.00	1.82	1.174	-0.577	0.074	0.014	0.000
NR 859	-10.14	22.48	1.86	1.193	-0.568	-0.153	0.299	-0.003
NR 860	-10.14	22.47	1.86	1.182	-0.566	-0.164	0.307	-0.010
NR 861	-10.17	44.95	1.99	1.286	-0.534	-0.413	0.378	-0.023
NR 862	-10.17	44.95	1.99	1.275	-0.556	-0.413	0.378	-0.024
NR 863	-10.19	67.48	1.98	1.216	-0.527	-0.868	0.996	0.048
NR 864	-10.18	89.98	1.64	0.843	-0.437	-0.919	0.972	0.051
NR 869	-5.12	0.00	1.73	1.386	-0.582	0.044	0.000	0.000
NR 868	-5.12	22.49	1.66	1.281	-0.574	-0.368	0.465	0.023
NR 867	-5.12	44.99	1.46	1.032	-0.546	-0.706	0.813	0.042
NR 866	-5.12	67.48	1.15	0.676	-0.510	-0.920	1.003	0.058
NR 865	-5.11	89.98	0.77	0.263	-0.463	-0.990	1.033	0.057
NR 870	-0.07	-0.01	0.98	0.883	-0.458	0.021	-0.004	-0.017
NR 871	-0.07	22.49	0.89	0.809	-0.436	-0.366	0.401	0.023
NR 872	-0.06	44.99	0.67	0.578	-0.469	-0.720	0.735	0.051
NR 873	-0.05	67.49	0.31	0.237	-0.472	-0.954	0.972	0.074
NR 874	-0.04	89.99	-0.09	-0.156	-0.477	-1.030	1.067	0.084
NR 879	5.00	0.08	0.04	0.316	-0.342	0.008	0.003	0.126
NR 878	5.00	22.38	-0.03	0.261	-0.367	-0.342	0.329	0.171
NR 877	5.01	45.08	-0.21	0.084	-0.371	-0.676	0.643	0.204
NR 876	5.02	67.38	-0.56	-0.247	-0.418	-0.935	0.909	0.222
NR 875	5.03	90.00	-0.94	-0.604	-0.474	-1.070	1.088	0.098
NR 880	10.06	0.08	-0.75	-0.064	-0.238	-0.004	0.000	0.127
NR 881	10.06	22.58	-0.80	-0.129	-0.296	-0.371	0.341	0.171
NR 882	10.07	45.09	-1.07	-0.414	-0.309	-0.768	0.749	0.207
NR 883	10.08	67.39	-1.41	-0.790	-0.383	-0.969	0.953	0.236
NR 884	10.09	90.09	-1.75	-1.138	-0.466	-1.057	1.064	0.243
NR 890	15.13	-0.01	-1.64	-0.604	-0.106	-0.003	0.033	-0.022
NR 891	15.13	22.30	-1.64	-0.603	-0.133	-0.403	0.427	0.029
NR 892	15.13	45.02	-1.77	-0.817	-0.228	-0.860	0.929	0.094
NR 893	15.12	67.48	-1.79	-0.931	-0.371	-0.639	0.907	0.056
NR 894	15.12	67.49	-1.79	-0.931	-0.371	-0.839	0.907	0.061
NR 895	15.10	89.96	-1.81	-1.000	-0.532	-0.921	0.950	0.016
NR 896	15.10	89.95	-1.80	-0.993	-0.532	-0.912	0.940	0.013
NR 905	20.17	-0.01	-2.14	-0.925	-0.113	-0.049	0.037	-0.014
NR 906	20.17	-0.01	-2.14	-0.925	-0.118	-0.043	0.032	-0.012
NR 903	20.19	22.43	-2.43	-1.187	-0.049	-0.809	0.788	-0.074
NR 904	20.18	22.44	-2.28	-1.030	-0.053	-0.385	0.352	-0.067
NR 901	20.17	45.11	-2.31	-1.080	-0.123	-0.749	0.828	0.243
NR 902	20.17	45.11	-2.31	-1.095	-0.128	-0.753	0.822	0.241
NR 899	20.15	67.51	-2.09	-0.939	-0.355	-0.693	0.752	0.094
NR 900	20.15	67.51	-2.08	-0.924	-0.355	-0.689	0.755	0.096
NR 897	20.13	89.99	-2.06	-0.974	-0.551	-0.790	0.802	0.070
NR 898	20.13	89.99	-2.08	-0.992	-0.551	-0.790	0.802	0.070

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E SFT-4PT TUNNEL RESULTS.

OR. NO.	ATTITUDE		C2	C4	COEFFICIENTS		C4	CL
	THETA	PHI			CX	CY		
NR 907	25.20	-0.02	-2.58	-1.095	-0.088	-0.035	0.002	-0.027
NR 908	25.20	22.39	-2.59	-1.107	-0.059	-0.406	0.321	-0.146
NR 909	25.20	22.39	-2.58	-1.092	-0.059	-0.415	0.333	-0.149
NR 910	25.20	45.22	-2.63	-1.157	-0.113	-0.817	0.815	0.416
NR 911	25.20	45.22	-2.63	-1.151	-0.115	-0.817	0.821	0.416
NR 912	25.17	67.33	-2.36	-0.929	-0.357	-0.704	0.752	0.125
NR 913	25.17	67.53	-2.35	-0.924	-0.362	-0.702	0.750	0.127
NR 914	25.16	90.03	-2.42	-1.052	-0.578	-0.809	0.809	0.126
NR 922	29.18	-0.01	-2.10	-0.379	-0.116	-0.049	0.013	-0.023
NR 923	29.18	-0.02	-2.09	-0.369	-0.106	-0.049	0.012	-0.026
NR 920	29.18	22.44	-2.10	-0.389	-0.072	-0.728	0.666	-0.065
NR 921	29.18	22.43	-2.10	-0.395	-0.072	-0.719	0.656	-0.076
NR 918	29.21	45.18	-2.57	-0.890	0.004	-1.266	1.259	0.353
NR 919	29.21	45.18	-2.58	-0.907	0.004	-1.263	1.281	0.349
NR 916	29.20	67.30	-2.67	-1.041	-0.301	-0.509	0.605	0.078
NR 917	29.18	67.30	-2.37	-0.737	-0.302	-1.187	1.285	0.075
NR 915	29.19	90.03	-2.76	-1.222	-0.523	-0.709	0.718	0.135
NR 856	-0.07	-0.02	0.99	0.912	-0.453	0.032	0.048	-0.031
NR 855	-0.07	0.08	0.97	0.883	-0.462	0.015	0.010	0.124
NR 856	0.00	0.09	-0.01	-0.011	0.000	-0.005	0.004	0.140
NR 889	-0.07	-0.02	0.99	0.927	-0.453	0.019	0.062	-0.026
NR 925	-0.12	-0.01	1.71	1.659	-0.458	0.026	0.022	-0.011
NR 926	-0.05	0.00	0.73	0.766	-0.001	0.006	0.002	0.004

(Run.13)

RUN NUMBER=13 SHORT BODY, SQUARE NOSE, LARGE TAIL
 CANT ANGLE= 0.0 CG POSITION 50.00%
 V= 240. FPS RB= 0.384 MILLION

OP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 1029	-10.13	-0.02	1.87	1.346	-0.938	0.089	-0.002	-0.026
NR 1030	-10.14	22.48	1.79	1.179	-0.938	0.030	0.136	0.010
NR 1031	-10.13	44.99	1.73	1.050	-0.929	0.092	0.071	0.045
NR 1032	-10.17	67.49	1.78	1.094	-0.937	0.143	-0.013	0.073
NR 1033	-10.20	89.99	1.84	1.141	-0.951	0.100	0.048	0.080
NR 1038	-5.07	-0.01	0.93	0.677	-0.919	0.082	-0.064	-0.021
NR 1037	-5.07	22.59	0.89	0.627	-0.915	0.047	0.023	0.017
NR 1036	-5.08	44.99	0.87	0.570	-0.913	0.080	0.051	0.046
NR 1035	-5.10	67.49	0.88	0.556	-0.916	0.032	0.077	0.068
NR 1034	-5.12	89.99	0.90	0.534	-0.911	0.040	0.106	0.078
NR 1039	0.00	-0.01	-0.04	-0.056	-0.903	0.074	-0.076	-0.017
NR 1040	0.00	22.49	-0.03	-0.033	-0.901	0.082	-0.006	0.024
NR 1041	-0.01	44.99	-0.03	-0.067	-0.893	0.029	0.047	0.052
NR 1042	-0.03	67.49	-0.04	-0.109	-0.899	0.016	0.087	0.077
NR 1043	-0.05	89.99	-0.05	-0.146	-0.899	-0.010	0.131	0.084
NR 1048	5.07	-0.01	-0.97	-0.723	-0.917	0.054	-0.059	-0.013
NR 1047	5.06	22.49	-0.93	-0.693	-0.916	0.044	-0.001	0.019
NR 1046	5.05	44.99	-0.91	-0.674	-0.906	-0.001	0.081	0.052
NR 1045	5.04	67.49	-0.93	-0.769	-0.916	-0.047	0.135	0.069
NR 1044	5.03	89.99	-0.99	-0.824	-0.921	-0.050	0.163	0.076
NR 1049	10.14	-0.01	-1.85	-1.297	-0.951	0.027	-0.021	-0.022
NR 1030	10.13	22.48	-1.79	-1.202	-0.933	0.048	-0.036	0.009
NR 1051	10.12	44.99	-1.75	-1.131	-0.919	-0.036	0.110	0.050
NR 1052	10.11	67.49	-1.81	-1.286	-0.934	-0.113	0.241	0.080
NR 1053	10.10	89.99	-1.88	-1.414	-0.954	-0.090	0.201	0.074
NR 1058	15.16	0.08	-2.15	-1.224	-1.022	0.025	0.006	-0.028
NR 1039	15.17	22.50	-2.31	-1.366	-0.980	-0.107	0.106	0.044
NR 1060	15.17	22.51	-2.31	-1.367	-0.975	-0.107	0.103	0.046
NR 1061	15.19	44.98	-2.59	-1.612	-0.913	-0.069	0.172	0.040
NR 1062	15.15	67.48	-2.28	-1.427	-0.987	-0.016	0.197	0.054
NR 1063	15.15	67.48	-2.28	-1.426	-0.992	-0.016	0.197	0.052
NR 1064	15.13	90.00	-2.19	-1.391	-1.027	-0.130	0.220	0.089
NR 1073	20.19	0.00	-2.46	-1.098	-1.134	-0.040	0.017	-0.006
NR 1074	20.19	-0.01	-2.46	-1.099	-1.129	-0.039	0.016	-0.020
NR 1071	20.20	22.50	-2.62	-1.226	-1.044	-0.281	0.230	0.032
NR 1072	20.20	22.50	-2.63	-1.238	-1.039	-0.283	0.232	0.036
NR 1069	20.24	44.98	-3.20	-1.839	-0.928	-0.034	0.097	0.036
NR 1070	20.24	44.98	-3.21	-1.857	-0.928	-0.031	0.080	0.025
NR 1067	20.18	67.31	-2.58	-1.232	-1.062	0.026	0.090	0.106
NR 1068	20.18	67.50	-2.59	-1.264	-1.062	0.042	0.072	0.087
NR 1065	20.16	90.00	-2.49	-1.229	-1.141	-0.180	0.247	0.090
NR 1066	20.16	90.00	-2.49	-1.230	-1.141	-0.180	0.232	0.095
NR 1075	25.23	-0.01	-2.94	-1.203	-1.174	-0.031	0.003	-0.010
NR 1076	25.23	-0.01	-2.93	-1.198	-1.179	-0.051	0.021	-0.020
NR 1077	25.24	22.56	-3.05	-1.280	-1.120	-0.536	0.461	0.136

R=RESULTS IN ROLLING BODY AXES.
 NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTO FIN BOMBLETS - R.A.E SPT-4PT TUNNEL RESULTS.

OP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 1078	25.24	22.36	-3.03	-1.290	-1.115	-0.548	0.489	0.133
NR 1079	25.28	44.96	-3.65	-1.914	-0.932	0.010	-0.008	0.000
NR 1080	25.28	44.96	-3.64	-1.909	-0.922	-0.008	-0.003	0.003
NR 1081	25.22	67.44	-2.98	-1.277	-1.140	0.288	-0.193	-0.023
NR 1082	25.22	67.44	-2.99	-1.276	-1.144	0.285	-0.193	-0.018
NR 1083	25.20	90.00	-2.94	-1.286	-1.180	-0.200	0.233	0.090
NR 1084	25.20	90.00	-2.94	-1.294	-1.180	-0.200	0.245	0.092
NR 1094	29.26	-0.01	-3.25	-1.304	-1.163	-0.048	0.018	-0.021
NR 1095	29.26	-0.01	-3.26	-1.315	-1.163	-0.054	0.013	-0.022
NR 1092	29.27	22.61	-3.39	-1.403	-1.106	-0.672	0.353	0.217
NR 1093	29.27	22.61	-3.38	-1.400	-1.106	-0.670	0.348	0.217
NR 1090	29.30	44.97	-3.89	-1.961	-0.913	-0.020	0.029	0.016
NR 1091	29.30	44.96	-3.89	-1.936	-0.928	-0.020	0.001	0.000
NR 1088	29.25	67.40	-3.30	-1.396	-1.131	0.349	-0.254	-0.087
NR 1089	29.25	67.40	-3.31	-1.388	-1.126	0.356	-0.260	-0.079
NR 1086	29.23	90.00	-3.26	-1.396	-1.166	-0.200	0.264	0.090
NR 1087	29.23	90.00	-3.24	-1.384	-1.171	-0.200	0.272	0.081
NR 1028	0.00	-0.02	-0.01	0.029	-0.893	0.092	-0.036	-0.027
NR 1034	0.00	-0.01	-0.02	-0.029	-0.898	0.068	-0.070	-0.012
NR 1057	0.00	0.08	0.00	0.039	-0.893	0.090	-0.034	-0.025
NR 1096	0.00	-0.01	-0.03	-0.008	-0.896	0.068	-0.062	-0.010

(Run.27) Part.1

RUN NUMBER=27 SHORT BODY, SQUARE NOSE, LARGE TAIL
CANT ANGLE= 2.5 CG POSITION 30.00%
V= 240, FPS RE= 0.384 MILLION

DP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 1976	-10.14	0.00	2.01	1.474	-1.027	0.096	-0.057	0.002
NR 1977	-10.14	0.00	2.00	1.456	-1.027	0.096	-0.063	0.000
NR 1978	-10.15	22.30	1.96	1.358	-0.998	-0.031	0.149	0.032
NR 1979	-10.15	22.30	1.96	1.351	-0.998	-0.031	0.147	0.030
NR 1980	-10.16	44.89	1.89	1.203	-0.974	-0.048	0.152	0.060
NR 1981	-10.18	67.49	1.84	1.193	-0.972	-0.027	0.104	0.074
NR 1982	-10.20	89.99	1.85	1.206	-0.976	-0.050	0.155	0.077
NR 1987	-5.08	-0.01	1.15	0.863	-0.949	0.090	-0.088	-0.013
NR 1986	-5.08	22.49	1.09	0.800	-0.949	-0.017	0.069	0.023
NR 1985	-5.09	45.09	1.01	0.708	-0.937	-0.062	0.130	0.056
NR 1984	-5.11	67.49	0.96	0.654	-0.940	-0.067	0.139	0.079
NR 1983	-5.13	89.99	0.94	0.606	-0.930	-0.090	0.185	0.083
NR 1988	-0.01	0.00	0.11	0.082	-0.909	0.076	-0.003	-0.003
NR 1989	-0.01	22.30	0.11	0.079	-0.911	-0.004	0.031	0.039
NR 1990	-0.02	45.00	0.09	0.040	-0.914	-0.068	0.137	0.071
NR 1991	-0.04	67.50	0.03	-0.039	-0.908	-0.127	0.220	0.094
NR 1992	-0.05	90.00	-0.04	-0.132	-0.913	-0.160	0.262	0.101
NR 1997	5.06	0.09	-0.78	-0.574	-0.917	0.034	-0.053	-0.014
NR 1996	5.05	22.50	-0.79	-0.580	-0.907	-0.049	0.080	0.034
NR 1995	5.05	45.01	-0.82	-0.614	-0.906	-0.108	0.181	0.078
NR 1994	5.04	67.51	-0.91	-0.733	-0.921	-0.160	0.253	0.108
NR 1993	5.03	90.01	-0.99	-0.860	-0.926	-0.170	0.271	0.118
NR 1998	10.12	0.09	-1.69	-1.133	-0.917	0.023	-0.026	-0.013
NR 1999	10.12	22.49	-1.62	-1.048	-0.913	-0.026	0.034	0.021
NR 2000	10.11	45.00	-1.64	-1.037	-0.919	-0.169	0.243	0.070
NR 2001	10.11	67.51	-1.78	-1.266	-0.934	-0.237	0.361	0.109
NR 2002	10.10	90.01	-1.88	-1.442	-0.944	-0.210	0.294	0.113
NR 2015	15.16	0.00	-2.17	-1.251	-0.977	0.003	0.044	0.004
NR 2016	15.16	0.00	-2.16	-1.242	-0.977	0.004	0.027	0.003
NR 2017	15.17	22.33	-2.30	-1.352	-0.940	-0.132	0.160	0.088
NR 2018	15.17	22.33	-2.30	-1.352	-0.940	-0.132	0.160	0.083
NR 2019	15.18	44.89	-2.47	-1.494	-0.898	-0.204	0.316	0.045
NR 2020	15.18	44.89	-2.47	-1.493	-0.898	-0.209	0.326	0.047
NR 2021	15.15	67.47	-2.23	-1.378	-0.992	-0.133	0.314	0.043
NR 2022	15.15	67.47	-2.24	-1.383	-0.987	-0.138	0.315	0.046
NR 2023	15.13	89.99	-2.18	-1.410	-1.036	-0.220	0.329	0.084
NR 2024	15.13	89.99	-2.18	-1.402	-1.036	-0.240	0.341	0.083
NR 2033	20.20	0.01	-2.56	-1.193	-1.030	-0.079	0.063	0.021
NR 2034	20.20	0.01	-2.55	-1.184	-1.030	-0.078	0.056	0.020
NR 2031	20.21	22.52	-2.70	-1.308	-0.975	-0.300	0.262	0.062
NR 2032	20.21	22.52	-2.70	-1.308	-0.975	-0.300	0.262	0.064

RR=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

(Run.27) Part.2

	DP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
		THETA	PHI			CX	CY		
NR	2029	20.23	45.02	-3.11	-1.740	-0.889	-0.010	0.090	-0.057
NR	2030	20.23	45.02	-3.12	-1.744	-0.889	-0.011	0.080	-0.058
NR	2027	20.18	67.47	-2.58	-1.263	-1.047	0.002	0.109	0.037
NR	2028	20.18	67.47	-2.58	-1.261	-1.047	0.011	0.115	0.038
NR	2025	20.16	89.99	-2.49	-1.253	-1.144	-0.210	0.286	0.074
NR	2026	20.16	89.99	-2.48	-1.239	-1.151	-0.210	0.278	0.080
NR	2035	25.23	0.01	-2.97	-1.220	-1.120	-0.087	0.052	0.022
NR	2036	25.23	0.01	-2.96	-1.218	-1.125	-0.093	0.058	0.010
NR	2037	25.24	22.58	-3.11	-1.325	-1.052	-0.620	0.578	0.164
NR	2038	25.24	22.58	-3.09	-1.314	-1.047	-0.618	0.577	0.168
NR	2039	25.28	44.91	-3.64	-1.903	-0.878	0.060	-0.047	-0.082
NR	2040	25.28	44.91	-3.65	-1.907	-0.873	0.052	-0.044	-0.088
NR	2041	25.22	67.43	-2.99	-1.300	-1.120	0.206	-0.113	-0.025
NR	2042	25.22	67.44	-2.99	-1.305	-1.120	0.197	-0.100	-0.019
NR	2043	25.20	90.00	-2.96	-1.323	-1.199	-0.230	0.289	0.094
NR	2044	25.20	89.99	-2.95	-1.314	-1.190	-0.261	0.313	0.077
NR	2053	29.26	0.01	-3.26	-1.284	-1.119	-0.090	0.067	0.012
NR	2054	29.26	0.00	-3.25	-1.289	-1.119	-0.091	0.067	0.004
NR	2051	29.27	22.63	-3.39	-1.409	-1.079	-0.736	0.648	0.238
NR	2052	29.27	22.63	-3.39	-1.420	-1.070	-0.736	0.642	0.238
NR	2050	29.30	44.92	-3.89	-1.968	-0.864	0.075	-0.053	-0.070
NR	2047	29.25	67.40	-3.29	-1.400	-1.101	0.268	-0.171	-0.083
NR	2048	29.25	67.40	-3.29	-1.400	-1.101	0.268	-0.171	-0.074
NR	2049	29.30	44.92	-3.89	-1.973	-0.859	0.075	-0.058	-0.077
NR	2045	29.23	89.99	-3.26	-1.428	-1.171	-0.261	0.319	0.073
NR	2046	29.23	90.00	-3.28	-1.430	-1.174	-0.260	0.319	0.079
NR	2003	-0.01	10.00	0.12	0.093	-0.907	0.031	-0.011	0.017
NR	2004	-0.01	10.00	0.12	0.100	-0.907	0.031	-0.002	0.017
NR	2005	-0.01	10.00	0.11	0.082	-0.907	0.027	-0.006	0.013
NR	2006	-0.01	10.00	0.12	0.102	-0.912	0.037	-0.008	0.014
NR	2007	-0.01	10.00	0.12	0.094	-0.912	0.037	-0.009	0.014
NR	2008	0.00	10.00	-0.01	-0.014	0.001	0.003	0.022	0.021
NR	2009	0.00	10.00	-0.01	-0.014	0.001	0.003	0.022	0.017
NR	2010	0.00	10.00	-0.01	-0.013	0.001	0.009	0.024	0.018
NR	2011	0.00	10.00	-0.01	-0.013	0.001	0.009	0.016	0.019
NR	1971	-0.01	0.09	0.14	0.136	-0.908	0.079	-0.066	-0.011
NR	1972	-0.01	-0.01	0.12	0.115	-0.908	0.063	-0.057	-0.012
NR	1973	-0.01	0.09	0.13	0.118	-0.908	0.073	-0.068	-0.013
NR	1974	-0.01	-0.01	0.12	0.100	-0.908	0.069	-0.071	-0.011
NR	1975	-0.14	0.00	1.99	1.463	-0.861	0.090	-0.051	0.000
NR	2014	-0.01	-0.01	0.14	0.168	-0.918	0.105	-0.061	-0.014
NR	2055	-0.01	0.00	0.13	0.157	-0.913	0.087	-0.066	-0.001

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

(Run.22)

RUN NUMBER=22 SHORT BODY, SQUARE NOSE, LARGE TAIL
CANT ANGLE= 3.0 CG POSITION 50.00%
V= 240.0 FPS RW= 0.384 MILLION

DP.NO.	ATTITUDE		COEFFICIENTS				CL
	THETA	PHI	C2	CM	CX	CY	
NR 1660	-10.15	0.00	2.04	1.557	-1.111	0.083	0.003
NR 1661	-10.15	0.00	2.04	1.573	-1.116	0.083	0.007
NR 1662	-10.16	22.34	2.11	1.567	-1.091	-0.080	0.294
NR 1662	-10.16	22.34	2.11	1.344	-1.091	-0.080	0.288
NR 1663	-10.16	22.34	2.11	1.544	-1.091	-0.080	0.288
NR 1664	-10.17	44.99	2.06	1.377	-1.048	-0.236	0.439
NR 1665	-10.17	44.99	2.06	1.372	-1.048	-0.260	0.432
NR 1666	-10.18	67.47	1.88	1.201	-1.016	-0.282	0.403
NR 1667	-10.18	67.47	1.88	1.207	-1.021	-0.280	0.402
NR 1668	-10.19	89.96	1.82	1.147	-1.000	-0.249	0.396
NR 1669	-10.19	89.96	1.82	1.144	-1.000	-0.259	0.371
NR 1674	-3.10	0.00	1.43	1.177	-1.018	0.047	-0.032
NR 1673	-3.10	22.49	1.34	1.063	-1.014	-0.145	0.229
NR 1672	-3.10	44.98	1.18	0.869	-0.992	-0.275	0.383
NR 1671	-3.11	67.47	1.03	0.693	-0.975	-0.311	0.430
NR 1671	-3.11	67.47	1.03	0.703	-0.975	-0.311	0.451
NR 1670	-3.12	89.97	0.90	0.553	-0.960	-0.300	0.409
NR 1675	-0.02	0.00	0.34	0.294	-0.933	0.039	-0.060
NR 1676	-0.03	22.30	0.32	0.279	-0.936	-0.112	0.131
NR 1677	-0.03	43.01	0.24	0.181	-0.934	-0.234	0.323
NR 1678	-0.04	67.31	0.11	0.018	-0.943	-0.346	0.427
NR 1679	-0.05	90.01	-0.06	-0.167	-0.943	-0.400	0.494
NR 1684	3.04	0.00	-0.80	-0.302	-0.923	0.044	-0.033
NR 1683	3.04	22.31	-0.35	-0.339	-0.922	-0.147	0.188
NR 1682	3.04	45.02	-0.66	-0.479	-0.924	-0.283	0.345
NR 1681	3.03	67.33	-0.85	-0.689	-0.940	-0.363	0.432
NR 1680	3.03	90.04	-0.99	-0.833	-0.948	-0.389	0.481
NR 1685	10.10	0.01	-1.39	-0.801	-0.878	0.018	-0.013
NR 1686	10.10	22.31	-1.33	-0.734	-0.889	-0.164	0.200
NR 1687	10.10	45.03	-1.45	-0.864	-0.909	-0.402	0.494
NR 1688	10.10	67.34	-1.71	-1.217	-0.953	-0.449	0.568
NR 1689	10.10	90.05	-1.88	-1.442	-0.998	-0.438	0.929
NR 1694	13.16	-0.02	-2.11	-1.191	-0.894	0.018	-0.004
NR 1693	13.16	-0.02	-2.10	-1.189	-0.889	0.011	0.004
NR 1696	13.16	22.49	-2.16	-1.200	-0.847	-0.132	0.166
NR 1696	13.16	22.49	-2.16	-1.134	-0.847	-0.132	0.191
NR 1697	13.16	22.49	-2.16	-1.200	-0.842	-0.132	0.166
NR 1698	13.17	45.01	-2.28	-1.294	-0.869	-0.436	0.573
NR 1699	13.17	45.01	-2.28	-1.294	-0.864	-0.436	0.573
NR 1700	13.14	67.32	-2.15	-1.298	-0.992	-0.372	0.332
NR 1701	13.14	67.31	-2.13	-1.298	-0.992	-0.372	0.532
NR 1702	13.13	90.04	-2.17	-1.363	-1.071	-0.478	0.547
NR 1703	13.13	90.04	-2.17	-1.363	-1.066	-0.478	0.347
NR 1712	20.20	0.00	-2.35	-1.177	-0.942	-0.046	-0.009
NR 1713	20.20	0.00	-2.55	-1.184	-0.942	-0.040	0.001
NR 1710	20.21	22.30	-2.70	-1.303	-0.877	-0.313	0.276

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS = R.A.E 3FT-4FT TUNNEL RESULTS.

DP.NO.	ATTITUDE		COEFFICIENTS				CL
	THETA	PHI	C2	CM	CX	CY	
NR 1711	20.21	22.31	-2.70	-1.304	-0.877	-0.320	0.237
NR 1708	20.22	44.97	-2.92	-1.529	-0.840	-0.253	0.362
NR 1709	20.22	44.96	-2.93	-1.321	-0.840	-0.262	0.354
NR 1706	20.18	67.32	-2.54	-1.204	-1.033	-0.271	0.392
NR 1707	20.18	67.32	-2.53	-1.203	-1.033	-0.280	0.394
NR 1704	20.16	90.04	-2.45	-1.199	-1.185	-0.468	0.505
NR 1705	20.16	90.04	-2.46	-1.198	-1.183	-0.468	0.497
NR 1714	23.24	0.00	-2.99	-1.234	-1.012	-0.062	0.010
NR 1715	23.24	0.00	-2.99	-1.229	-1.012	-0.062	0.001
NR 1716	23.24	22.36	-3.08	-1.304	-0.944	-0.530	0.458
NR 1717	23.24	22.36	-3.08	-1.293	-0.939	-0.531	0.472
NR 1718	23.27	44.92	-3.52	-1.740	-0.819	-0.101	0.134
NR 1719	23.27	44.92	-3.30	-1.738	-0.814	-0.111	0.131
NR 1720	23.22	67.48	-2.98	-1.252	-1.100	-0.011	0.099
NR 1721	23.22	67.48	-2.98	-1.239	-1.096	-0.034	0.140
NR 1722	23.20	90.04	-2.93	-1.265	-1.224	-0.438	0.483
NR 1723	23.20	90.04	-2.94	-1.288	-1.219	-0.448	0.501
NR 1732	29.26	0.00	-3.21	-1.225	-1.031	-0.059	0.010
NR 1733	29.26	-0.01	-3.20	-1.222	-1.031	-0.066	0.023
NR 1730	29.27	22.41	-3.34	-1.339	-1.085	-0.717	0.413
NR 1731	29.27	22.41	-3.33	-1.361	-1.103	-0.729	0.429
NR 1728	29.29	44.99	-3.78	-1.838	-0.790	-0.036	0.058
NR 1729	29.29	44.99	-3.79	-1.822	-0.813	-0.029	0.049
NR 1726	29.25	67.45	-3.30	-1.363	-1.087	0.037	0.063
NR 1727	29.23	67.45	-3.30	-1.363	-1.082	0.049	0.031
NR 1724	29.23	90.04	-3.23	-1.374	-1.203	-0.448	0.489
NR 1723	29.23	90.04	-3.23	-1.382	-1.203	-0.448	0.489
NR 1639	-0.02	-0.01	0.36	0.363	-0.933	0.077	-0.053
NR 1690	-0.02	0.00	0.34	0.311	-0.933	0.058	-0.059
NR 1693	-0.03	-0.01	0.37	0.388	-0.928	0.089	-0.048
NR 1734	-0.02	0.00	0.34	0.334	-0.938	0.052	-0.054

(Run.12) Part.1

RUN NUMBER=12 SHORT BODY, SQUARE NOSE, LARGE TAIL
CANT ANGLE=10.0 CG POSITION 50.00%
V= 240, FPS RE= 0.384 MILLION

DP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 929	-10.14	0.02	1.93	1.377	-1.243	0.105	-0.044	0.034
NR 930	-10.14	0.03	1.92	1.374	-1.243	0.117	-0.055	0.048
NR 931	-10.15	22.56	2.04	1.429	-1.218	0.007	0.163	0.133
NR 932	-10.15	22.56	2.04	1.426	-1.213	-0.007	0.167	0.128
NR 933	-10.18	45.05	2.19	1.500	-1.185	-0.386	0.577	0.156
NR 934	-10.18	45.05	2.19	1.500	-1.180	-0.386	0.577	0.158
NR 935	-10.18	67.43	1.95	1.298	-1.124	-0.639	0.756	-0.025
NR 936	-10.18	67.43	1.96	1.307	-1.124	-0.637	0.744	-0.032
NR 937	-10.19	89.90	1.76	1.129	-1.065	-0.627	0.719	-0.059
NR 938	-10.19	89.91	1.76	1.121	-1.065	-0.627	0.720	-0.057
NR 946	-5.13	0.00	1.89	1.642	-1.180	0.047	-0.035	0.001
NR 947	-5.13	0.00	1.89	1.641	-1.180	0.047	-0.035	0.004
NR 944	-5.13	22.49	1.75	1.480	-1.162	-0.360	0.441	0.013
NR 945	-5.13	22.49	1.75	1.472	-1.162	-0.360	0.438	0.017
NR 942	-5.12	44.96	1.46	1.158	-1.125	-0.616	0.715	-0.002
NR 943	-5.12	44.96	1.46	1.153	-1.120	-0.616	0.710	-0.003
NR 941	-5.12	67.43	1.12	0.809	-1.074	-0.691	0.774	-0.028
NR 939	-5.12	89.92	0.86	0.550	-1.029	-0.689	0.770	-0.030
NR 940	-5.12	89.92	0.86	0.550	-1.034	-0.689	0.770	-0.032
NR 969	-0.05	-0.01	0.73	0.682	-1.007	0.044	-0.044	-0.022
NR 970	0.00	0.00	-0.01	-0.010	0.000	-0.006	0.006	0.003
NR 972	-0.05	-0.02	0.77	0.746	-1.012	0.075	-0.053	-0.038
NR 948	-0.05	-0.01	0.73	0.651	-1.006	0.045	-0.069	-0.023
NR 949	-0.05	22.49	0.67	0.593	-1.010	-0.275	0.278	0.024
NR 950	-0.05	44.99	0.47	0.397	-1.004	-0.551	0.557	0.059
NR 951	-0.05	67.50	0.23	0.153	-1.017	-0.716	0.762	0.092
NR 952	-0.05	90.00	-0.07	-0.157	-1.026	-0.800	0.867	0.099
NR 957	5.01	0.00	-0.15	-0.018	-0.962	0.017	-0.019	-0.008
NR 956	5.01	22.61	-0.23	-0.098	-0.966	-0.312	0.321	0.058
NR 955	5.02	45.03	-0.44	-0.287	-0.970	-0.551	0.578	0.117
NR 954	5.03	67.56	-0.74	-0.588	-0.994	-0.674	0.743	0.183
NR 953	5.03	90.07	-1.00	-0.852	-1.038	-0.739	0.817	0.218
NR 958	10.07	0.00	-0.89	-0.340	-0.898	-0.002	0.001	-0.008
NR 959	10.07	0.00	-0.89	-0.340	-0.899	-0.001	-0.008	-0.007
NR 960	10.07	22.51	-0.92	-0.371	-0.909	-0.364	0.380	0.047
NR 961	10.07	22.51	-0.92	-0.378	-0.909	-0.364	0.377	0.050
NR 962	10.08	45.03	-1.21	-0.653	-0.944	-0.683	0.746	0.120
NR 963	10.08	45.03	-1.21	-0.653	-0.944	-0.683	0.746	0.123
NR 964	10.10	67.56	-1.62	-1.132	-0.963	-0.743	0.835	0.187
NR 965	10.10	67.55	-1.62	-1.133	-0.968	-0.746	0.828	0.179
NR 966	10.10	90.09	-1.85	-1.410	-1.076	-0.767	0.851	0.242
NR 967	10.10	90.09	-1.86	-1.422	-1.081	-0.767	0.851	0.239
NR 973	15.14	-0.01	-1.80	-0.849	-0.801	0.008	0.007	-0.017
NR 974	15.14	-0.02	-1.80	-0.857	-0.801	0.008	0.006	-0.026
NR 989	15.14	-0.01	-1.82	-0.909	-0.804	-0.009	-0.023	-0.020
NR 990	15.14	-0.01	-1.81	-0.892	-0.801	-0.008	-0.032	-0.018
NR 975	15.13	22.50	-1.74	-0.777	-0.828	-0.351	0.365	0.035

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

(Run.12) Part.2

	DP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
		THETA	PHI			CX	CY		
NR	976	15.13	22.50	-1.74	=0.777	-0.828	-0.331	0.365	0.030
NR	987	15.13	22.60	-1.76	-0.807	-0.828	-0.332	0.321	0.037
NR	988	13.13	22.60	-1.73	-0.798	-0.828	-0.336	0.323	0.038
NR	977	13.14	45.01	-1.98	-1.031	-0.899	-0.809	0.893	0.088
NR	978	13.14	45.01	-1.98	-1.031	-0.899	-0.809	0.893	0.088
NR	985	13.13	45.02	-2.00	-1.032	-0.904	-0.806	0.870	0.097
NR	986	15.15	45.02	-1.99	-1.027	-0.904	-0.801	0.865	0.095
NR	979	13.14	67.51	-2.03	-1.220	-1.031	-0.683	0.783	0.109
NR	980	15.14	67.51	-2.03	-1.220	-1.036	-0.683	0.783	0.109
NR	983	15.14	67.52	-2.03	-1.208	-1.031	-0.673	0.767	0.114
NR	984	15.14	67.51	-2.03	-1.211	-1.031	-0.676	0.760	0.112
NR	981	13.12	90.07	-2.10	-1.301	-1.159	-0.807	0.839	0.202
NR	982	15.12	90.06	-2.11	-1.306	-1.149	-0.808	0.848	0.199
NR	992	20.19	-0.01	-2.39	-1.089	-1.040	-0.026	-0.027	-0.012
NR	993	20.19	0.00	-2.39	-1.089	-1.040	-0.026	-0.036	-0.004
NR	994	20.20	22.48	-2.33	-1.173	-0.930	-0.323	0.260	-0.002
NR	995	20.20	22.48	-2.34	-1.169	-0.930	-0.321	0.256	-0.002
NR	996	20.20	44.98	-2.65	-1.260	-1.032	-0.672	0.734	0.036
NR	997	20.20	44.98	-2.63	-1.267	-1.037	-0.668	0.740	0.028
NR	998	20.17	67.50	-2.43	-1.117	-1.259	-0.310	0.569	0.084
NR	999	20.17	67.50	-2.43	-1.116	-1.263	-0.499	0.357	0.087
NR	1000	20.13	90.06	-2.41	-1.158	-1.455	-0.767	0.768	0.190
NR	1001	20.15	90.06	-2.13	-1.020	-1.321	-0.768	0.739	0.171
NR	1011	23.23	-0.01	-2.93	-1.180	-0.860	-0.056	-0.013	-0.018
NR	1012	23.23	0.00	-2.94	-1.204	-0.860	-0.055	-0.014	0.000
NR	1009	23.24	22.63	-3.06	-1.279	-0.782	-0.307	0.421	0.087
NR	1010	25.24	22.63	-3.06	-1.293	-0.782	-0.307	0.415	0.089
NR	1007	23.26	44.93	-3.27	-1.492	-0.770	-0.443	0.476	-0.047
NR	1008	24.77	44.93	-3.26	-1.485	-0.773	-0.452	0.485	-0.046
NR	1005	25.22	67.48	-2.93	-1.222	-1.091	-0.306	0.383	0.045
NR	1006	23.22	67.48	-2.93	-1.220	-1.086	-0.295	0.373	0.054
NR	1002	23.20	90.07	-2.87	-1.235	-1.297	-0.716	0.708	0.209
NR	1003	23.20	90.07	-2.87	-1.240	-1.287	-0.726	0.725	0.211
NR	1004	23.20	90.07	-2.87	-1.235	-1.297	-0.706	0.706	0.206
NR	1013	29.25	0.00	-3.17	-1.185	-0.901	-0.076	0.011	0.004
NR	1014	29.25	0.00	-3.17	-1.184	-1.020	-0.076	0.011	-0.005
NR	1015	29.26	22.61	-3.01	-1.138	-0.948	-0.841	0.666	0.212
NR	1016	29.26	22.60	-3.29	-1.262	-0.948	-0.745	0.627	0.203
NR	1017	29.08	44.88	-3.59	-1.618	-0.862	-0.278	0.307	-0.137
NR	1018	28.73	44.89	-3.61	-1.629	-0.874	-0.276	0.306	-0.125
NR	1019	29.25	67.47	-3.24	-1.323	-1.194	-0.185	0.294	0.020
NR	1020	29.25	67.46	-3.14	-1.272	-1.184	-0.448	0.426	0.011
NR	1021	29.23	90.08	-3.16	-1.353	-1.405	-0.676	0.710	0.208
NR	1022	29.23	90.08	-3.18	-1.363	-1.400	-0.666	0.692	0.221
NR	928	-0.05	-0.02	0.74	0.692	-1.007	0.050	-0.050	-0.026
NR	1023	-0.05	-0.01	0.76	0.719	-1.012	0.043	-0.062	-0.021

(Run.14)

RUN NUMBER=14 SHORT BODY, ROUND NOSE, SMALL TAIL
CANT ANGLE= 0.0 CG POSITION 50.00X
V= 240, FPS RE= 0.384 MILLION

DP.NO.	ATTITUDE				COEFFICIENTS		CN	CL
	THETA	PHI	C2	CM	CX	CY		
NR 1100	-10.06	-0.01	0.73	0.091	-0.237	0.023	0.042	-0.014
NR 1101	-10.06	22.49	0.67	0.018	-0.243	-0.004	0.115	0.021
NR 1102	-10.07	44.99	0.64	-0.054	-0.243	0.031	0.113	0.031
NR 1103	-10.09	67.49	0.63	-0.083	-0.243	0.075	0.082	0.072
NR 1104	-10.11	89.99	0.67	-0.104	-0.243	0.070	0.089	0.074
NR 1109	-5.03	0.00	0.31	-0.013	-0.234	0.014	0.014	-0.006
NR 1108	-5.03	22.50	0.29	-0.050	-0.231	0.011	0.063	0.028
NR 1107	-5.04	45.00	0.27	-0.089	-0.229	0.030	0.077	0.033
NR 1106	-5.05	67.49	0.27	-0.129	-0.233	0.046	0.080	0.073
NR 1105	-5.07	89.99	0.28	-0.163	-0.232	0.050	0.088	0.078
NR 1110	0.00	0.00	-0.03	-0.015	-0.221	0.012	0.003	-0.002
NR 1111	0.00	22.50	-0.05	-0.042	-0.219	0.005	0.055	0.031
NR 1112	-0.01	45.00	-0.05	-0.080	-0.217	0.007	0.083	0.057
NR 1113	-0.03	67.50	-0.06	-0.110	-0.221	0.031	0.069	0.077
NR 1114	-0.04	0.00	-0.04	0.069	-0.221	-0.052	0.135	0.083
NR 1119	5.03	0.00	-0.35	-0.001	-0.227	0.015	-0.003	-0.004
NR 1118	5.03	22.50	-0.36	-0.017	-0.226	0.017	0.024	0.033
NR 1117	5.02	45.00	-0.37	-0.043	-0.223	0.016	0.062	0.062
NR 1116	5.00	67.50	-0.38	-0.084	-0.230	0.005	0.082	0.079
NR 1115	4.98	80.00	-0.38	-0.111	-0.233	-0.046	0.096	0.086
NR 1120	10.06	0.00	-0.74	-0.078	-0.234	0.006	-0.001	-0.002
NR 1121	0.06	21.50	0.54	1.075	-0.234	-0.483	0.458	0.030
NR 1122	10.05	45.00	-0.70	-0.064	-0.234	-0.010	0.077	0.060
NR 1123	10.03	67.50	-0.74	-0.129	-0.239	-0.036	0.114	0.080
NR 1124	10.02	90.00	-0.77	-0.190	-0.239	0.000	0.083	0.083
NR 1129	15.10	0.00	-1.17	-0.161	-0.202	0.007	0.024	-0.004
NR 1130	15.09	22.49	-1.12	-0.142	-0.218	0.039	0.036	0.022
NR 1131	15.08	45.00	-1.08	-0.141	-0.228	-0.029	0.126	0.054
NR 1132	15.07	67.50	-1.14	-0.248	-0.214	-0.103	0.212	0.077
NR 1133	15.06	90.10	-1.20	-0.349	-0.205	-0.048	0.159	0.079
NR 1138	20.13	0.10	-1.60	-0.317	-0.202	-0.001	0.005	-0.004
NR 1137	20.12	22.50	-1.53	-0.270	-0.223	0.043	0.010	0.025
NR 1136	20.11	45.00	-1.50	-0.281	-0.223	-0.042	0.117	0.052
NR 1135	20.11	67.50	-1.53	-0.359	-0.226	-0.132	0.211	0.070
NR 1134	20.10	90.10	-1.62	-0.483	-0.197	-0.057	0.149	0.080
NR 1139	25.15	0.10	-1.83	-0.324	-0.268	-0.009	0.001	-0.006
NR 1140	25.15	22.54	-1.88	-0.350	-0.241	-0.022	0.007	0.103
NR 1141	25.15	45.00	-1.91	-0.421	-0.224	-0.054	0.108	0.033
NR 1142	25.14	67.45	-1.88	-0.424	-0.246	-0.088	0.204	-0.006
NR 1143	25.12	90.00	-1.84	-0.449	-0.280	-0.080	0.151	0.079
NR 1148	29.17	-0.01	-2.08	-0.408	-0.301	0.037	-0.051	-0.013
NR 1147	29.18	22.55	-2.16	-0.464	-0.266	-0.066	0.034	0.117
NR 1146	29.17	44.98	-2.17	-0.477	-0.200	-0.064	0.111	0.028
NR 1145	29.16	67.43	-2.14	-0.506	-0.256	-0.000	0.119	-0.033

NR=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS = R.A.E 3FY-4FT TUNNEL RESULTS.

DP.NO.	ATTITUDE				COEFFICIENTS		CN	CL
	THETA	PHI	C2	CM	CX	CY		
NR 1144	29.14	00.00	-2.08	-0.318	-0.310	-0.060	0.127	0.076
NR 1149	0.00	-0.01	-0.00	0.047	-0.221	0.023	0.023	-0.011
NR 1125	0.00	0.00	-0.02	-0.005	-0.216	0.011	0.012	0.001
NR 1128	0.00	-0.01	0.01	0.063	-0.211	0.017	0.038	-0.009
NR 1149	0.00	0.00	-0.01	0.021	-0.216	0.005	0.026	0.003

NR=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

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26

(Run.25)

RUN NUMBER=23 SHORT BODY, ROUND NOSE, SMALL TAIL
CANT ANGLE= 2.5 CG POSITION 50.00%
V= 240, FPS RE= 0.384 MILLION

OP.NO.	ATTITUDE					COEFFICIENTS		CN	CL
	THETA	PHI				CX	CY		
NR 1858	-10.06	-0.01	0.82	0.173	-0.247	0.036	0.022	-0.011	
NR 1859	-10.06	22.49	0.76	0.099	-0.248	=0.042	0.147	0.021	
NR 1860	-10.07	45.00	0.70	0.001	-0.280	=0.010	0.140	0.053	
NR 1861	-10.09	67.50	0.68	=0.039	-0.243	0.022	0.123	0.077	
NR 1862	-10.11	90.00	0.69	=0.092	-0.248	0.010	0.127	0.079	
NR 1867	-5.03	0.00	0.37	0.033	-0.234	0.033	-0.003	-0.004	
NR 1866	-5.03	22.30	0.35	=0.002	-0.236	0.006	0.070	0.030	
NR 1865	-5.04	45.00	0.32	=0.053	-0.239	=0.004	0.106	0.059	
NR 1864	-5.06	67.30	0.30	=0.118	-0.237	0.014	0.096	0.078	
NR 1863	-5.07	90.00	0.30	=0.144	-0.232	0.010	0.106	0.084	
NR 1868	0.00	0.00	0.01	0.003	-0.216	0.024	-0.009	-0.006	
NR 1869	0.00	22.30	-0.00	=0.009	-0.219	=0.002	0.046	0.031	
NR 1870	-0.01	43.00	-0.02	=0.047	-0.217	=0.009	0.084	0.062	
NR 1871	-0.03	67.30	-0.03	=0.084	-0.221	=0.013	0.097	0.082	
NR 1872	-0.04	90.00	-0.03	=0.109	-0.221	=0.010	0.113	0.090	
NR 1877	5.03	0.00	-0.30	0.033	-0.227	0.029	-0.043	-0.003	
NR 1876	5.02	22.30	-0.30	0.026	-0.226	0.001	0.018	0.031	
NR 1875	5.01	43.00	-0.32	=0.002	-0.228	=0.011	0.062	0.060	
NR 1874	5.00	67.50	-0.35	=0.031	-0.225	=0.026	0.086	0.078	
NR 1873	4.99	90.00	-0.37	=0.103	-0.223	=0.010	0.091	0.090	
NR 1878	10.06	0.00	-0.68	=0.016	-0.229	0.007	-0.034	-0.004	
NR 1879	10.03	22.30	-0.66	0.002	-0.229	=0.009	0.014	0.029	
NR 1880	10.04	45.00	-0.67	=0.022	-0.229	=0.064	0.088	0.037	
NR 1881	10.03	67.30	-0.73	=0.093	-0.239	=0.093	0.140	0.079	
NR 1882	10.02	90.00	-0.77	=0.159	-0.239	=0.050	0.111	0.085	
NR 1887	15.09	0.00	-1.11	-0.134	-0.203	0.003	-0.036	-0.003	
NR 1886	15.09	22.49	-1.06	-0.107	-0.213	0.004	-0.006	0.020	
NR 1885	15.08	45.10	-1.04	=0.086	-0.229	=0.093	0.114	0.059	
NR 1884	15.07	67.30	-1.14	=0.200	-0.220	=0.127	0.163	0.080	
NR 1883	15.06	90.00	-1.21	=0.289	-0.213	=0.070	0.117	0.083	
NR 1888	20.13	0.00	-1.55	=0.305	-0.178	=0.006	-0.039	-0.006	
NR 1889	20.12	22.49	-1.48	=0.248	-0.204	0.025	-0.034	0.020	
NR 1890	20.11	45.00	-1.46	=0.228	-0.221	=0.071	0.069	0.053	
NR 1891	20.11	67.30	-1.53	=0.319	-0.222	=0.170	0.196	0.074	
NR 1892	20.10	90.00	-1.64	=0.429	-0.222	=0.100	0.136	0.078	
NR 1897	25.16	-0.01	-1.86	=0.358	-0.219	0.003	-0.093	-0.009	
NR 1896	25.15	22.33	-1.83	=0.314	-0.217	=0.028	-0.011	0.072	
NR 1895	25.15	44.99	-1.86	=0.353	-0.210	=0.110	0.110	0.044	
NR 1894	25.14	67.46	-1.86	=0.356	-0.236	=0.177	0.232	0.001	
NR 1893	25.12	90.00	-1.87	=0.439	-0.266	=0.120	0.137	0.084	
NR 1898	29.18	0.00	-2.11	=0.432	-0.228	=0.018	-0.033	-0.003	
NR 1899	29.18	22.54	-2.13	=0.423	-0.197	=0.049	-0.013	0.101	
NR 1900	29.17	44.97	-2.13	=0.414	-0.183	=0.109	0.112	0.008	
NR 1901	29.16	67.45	-2.14	=0.489	-0.246	=0.175	0.231	-0.018	

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS = R.A.E 3FT-4FT TUNNEL RESULTS.

OP.NO.	ATTITUDE					COEFFICIENTS		CN	CL
	THETA	PHI				CX	CY		
NR 1902	29.15	89.99	-2.15	-0.543	-0.206	=0.040	0.083	0.039	
NR 1897	0.00	-0.01	0.03	0.054	-0.211	0.036	0.003	-0.009	
NR 1903	0.00	0.00	0.01	0.019	-0.216	0.018	-0.003	0.003	

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

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26

(Run.20)

RUN NUMBER=20 SHORT BODY, ROUND NOSE, SMALL TAIL
CANT ANGLE= 5.0 CG POSITION 50.00%
V= 240, FPS RE= 0.384 MILLION

OP.NO.	ATTITUDE THETA	PHI	CZ	CH	COEFFICIENTS CX	CY	CN	CL
NR 1491	-10.07	22.49	0.82	0.149	-0.243	-0.085	0.197	0.019
NR 1492	-10.07	44.99	0.71	0.019	-0.240	-0.078	0.211	0.049
NR 1493	-10.09	67.49	0.68	-0.062	-0.248	-0.033	0.180	0.070
NR 1494	-10.10	89.99	0.67	-0.110	-0.243	-0.020	0.142	0.076
NR 1499	-5.03	0.00	0.44	0.097	-0.249	0.009	0.028	-0.002
NR 1498	-5.04	22.30	0.39	0.043	-0.246	-0.046	0.124	0.029
NR 1497	-5.04	45.00	0.35	-0.021	-0.244	-0.063	0.173	0.055
NR 1496	-5.06	67.30	0.30	-0.104	-0.237	-0.039	0.155	0.076
NR 1495	-5.07	90.00	0.27	-0.168	-0.232	-0.040	0.157	0.081
NR 1500	0.00	0.00	0.03	0.044	-0.231	0.000	0.016	-0.001
NR 1501	-0.01	22.50	0.02	0.008	-0.229	-0.036	0.089	0.034
NR 1502	-0.01	45.00	0.00	-0.019	-0.227	-0.093	0.128	0.063
NR 1503	-0.03	67.50	-0.03	-0.089	-0.226	-0.057	0.153	0.080
NR 1504	-0.04	90.00	-0.06	-0.147	-0.231	-0.030	0.146	0.086
NR 1509	5.02	0.00	-0.23	0.079	-0.227	-0.008	0.011	-0.003
NR 1508	5.02	22.60	-0.27	0.057	-0.226	-0.027	0.056	0.036
NR 1507	5.01	45.00	-0.30	0.015	-0.230	-0.089	0.116	0.064
NR 1506	5.00	67.50	-0.35	-0.052	-0.233	-0.037	0.121	0.082
NR 1505	4.99	90.00	-0.39	-0.129	-0.233	-0.070	0.152	0.090
NR 1510	10.05	0.00	-0.60	0.067	-0.229	0.007	-0.010	0.001
NR 1511	10.05	22.30	-0.59	0.076	-0.234	-0.034	0.072	0.035
NR 1512	10.04	45.00	-0.63	0.004	-0.239	-0.107	0.161	0.061
NR 1513	10.03	67.50	-0.71	-0.098	-0.239	-0.132	0.195	0.081
NR 1514	10.02	90.10	-0.78	-0.188	-0.249	-0.099	0.176	0.088
NR 1519	15.09	0.00	-1.01	-0.012	-0.193	0.009	0.014	-0.003
NR 1520	15.08	22.30	-0.96	0.007	-0.213	-0.018	0.090	0.030
NR 1521	15.07	45.01	-1.00	-0.061	-0.224	-0.133	0.233	0.049
NR 1522	15.07	67.50	-1.13	-0.234	-0.219	-0.174	0.251	0.083
NR 1523	15.06	90.00	-1.22	-0.360	-0.220	-0.120	0.193	0.084
NR 1528	20.12	0.00	-1.45	-0.194	-0.153	0.000	-0.013	-0.003
NR 1527	20.11	22.49	-1.38	-0.137	-0.189	-0.015	0.055	0.024
NR 1526	20.11	45.10	-1.42	-0.199	-0.206	-0.134	0.225	0.067
NR 1525	20.11	67.50	-1.54	-0.352	-0.212	-0.215	0.273	0.077
NR 1524	20.10	90.00	-1.64	-0.501	-0.217	-0.130	0.200	0.086
NR 1529	25.16	0.00	-1.88	-0.378	-0.141	-0.004	-0.021	0.004
NR 1530	25.16	0.00	-1.88	-0.377	-0.141	-0.010	-0.016	0.004
NR 1531	25.13	22.30	-1.77	-0.275	-0.168	-0.046	0.059	0.034
NR 1532	25.15	22.50	-1.77	-0.283	-0.173	-0.046	0.040	0.028
NR 1533	25.14	44.99	-1.80	-0.326	-0.205	-0.158	0.167	0.042
NR 1534	25.14	67.45	-1.86	-0.397	-0.241	-0.207	0.276	-0.007
NR 1535	25.12	90.00	-1.88	-0.494	-0.273	-0.140	0.182	0.086
NR 1541	29.17	-0.01	-2.03	-0.357	-0.174	0.013	-0.043	-0.011
NR 1540	29.17	22.55	-2.08	-0.395	-0.178	-0.116	0.064	0.106
NR 1539	29.17	45.06	-2.07	-0.583	-0.161	-0.148	0.183	-0.012

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMELETS - R.A.E 3PT+4PT TUNNEL RESULTS.

OP.NO.	ATTITUDE THETA	PHI	CZ	CH	COEFFICIENTS CX	CY	CN	CL
NR 1538	29.16	67.43	-2.10	-0.461	-0.256	-0.092	0.203	-0.037
NR 1536	29.15	90.00	-2.11	-0.560	-0.305	-0.070	0.114	0.078
NR 1515	0.00	0.00	0.06	0.062	-0.226	0.006	0.010	0.003
NR 1518	0.00	0.00	0.07	0.088	-0.221	0.017	0.038	-0.004
NR 1542	0.00	0.00	0.05	0.067	-0.221	0.005	0.026	0.009

(Run.17)

RUN NUMBER=17 SHORT BODY, ROUND NOSE, SMALL TAIL
CANT ANGLE=10.0 CB POSITION 90.00%
V= 240. FPS RE= 0.384 MILLION

DP.NO.	ATTITUDE		COEFFICIENTS					
	THETA	PHI	CZ	CM	CX	CY	CN	CL
NR 1288	-10.08	-0.01	1.07	0.394	-0.316	0.032	0.042	-0.014
NR 1289	-10.08	22.49	0.99	0.294	-0.517	-0.115	0.224	0.017
NR 1290	-10.08	44.99	0.87	0.149	-0.309	-0.178	0.309	0.045
NR 1291	-10.09	67.49	0.75	-0.013	-0.292	-0.195	0.291	0.062
NR 1292	-10.11	89.99	0.69	-0.107	-0.247	-0.140	0.258	0.068
NR 1297	-5.04	0.00	0.59	0.237	-0.298	0.016	0.058	-0.008
NR 1296	-5.05	22.49	0.54	0.170	-0.290	-0.091	0.199	0.024
NR 1295	-5.05	44.99	0.45	0.061	-0.288	-0.149	0.247	0.049
NR 1294	-5.06	67.49	0.57	-0.063	-0.277	-0.191	0.266	0.067
NR 1295	-5.07	89.99	0.29	-0.162	-0.247	-0.140	0.238	0.073
NR 1298	-0.01	0.00	0.16	0.127	-0.260	0.019	0.021	-0.008
NR 1299	-0.01	22.49	0.15	0.085	-0.258	-0.061	0.118	0.025
NR 1300	-0.02	45.00	0.08	0.029	-0.257	-0.115	0.182	0.034
NR 1301	-0.03	67.50	0.02	-0.057	-0.256	-0.145	0.217	0.074
NR 1302	-0.04	90.00	-0.05	-0.151	-0.260	-0.190	0.226	0.082
NR 1307	5.02	0.00	-0.18	0.120	-0.247	0.016	0.005	-0.004
NR 1306	5.01	22.50	-0.20	0.092	-0.246	-0.047	0.078	0.030
NR 1305	5.01	45.00	-0.25	0.032	-0.245	-0.104	0.168	0.058
NP 1304	5.00	67.50	-0.51	-0.047	-0.254	-0.149	0.197	0.076
NR 1305	4.99	90.00	-0.58	-0.141	-0.244	-0.170	0.233	0.088
NR 1308	10.04	0.00	-0.50	0.131	-0.239	0.002	-0.005	-0.006
NR 1309	10.04	22.50	-0.51	0.119	-0.244	-0.058	0.082	0.030
NR 1310	10.04	45.00	-0.58	0.050	-0.244	-0.141	0.169	0.058
NR 1311	10.04	67.50	-0.68	-0.082	-0.255	-0.183	0.222	0.079
NR 1312	10.02	90.00	-0.77	-0.189	-0.275	-0.190	0.224	0.083
NR 1317	15.07	-0.01	-0.84	0.093	-0.215	-0.013	-0.002	-0.008
NR 1316	15.07	22.50	-0.85	0.082	-0.228	-0.083	0.079	0.024
NR 1315	15.07	45.00	-0.93	-0.005	-0.234	-0.218	0.237	0.063
NR 1314	15.07	67.50	-1.09	-0.192	-0.229	-0.236	0.253	0.082
NR 1313	15.06	90.00	-1.19	-0.311	-0.249	-0.220	0.249	0.085
NR 1318	20.11	-0.01	-1.02	0.085	-0.163	-0.017	-0.004	-0.008
NR 1319	20.10	22.49	-1.22	-0.011	-0.258	-0.070	0.070	0.021
NR 1320	20.10	45.00	-1.27	-0.080	-0.402	-0.257	0.261	0.065
NP 1321	20.10	67.50	-1.46	-0.281	-0.270	-0.302	0.320	0.078
NR 1322	20.10	90.00	-1.55	-0.315	-0.290	-0.250	0.276	0.060
NR 1327	25.15	0.00	-1.72	-0.213	-0.118	-0.015	-0.019	-0.007
NR 1326	25.14	22.49	-1.63	-0.147	-0.145	-0.091	0.097	0.014
NR 1325	25.13	45.00	-1.68	-0.215	-0.195	-0.270	0.266	0.032
NR 1324	25.00	67.45	-1.78	-0.322	-0.257	-0.250	0.292	-0.009
NR 1325	25.12	89.98	-1.78	-0.400	-0.515	-0.111	0.159	0.043
NR 1328	29.17	0.00	-2.03	-0.350	-0.091	-0.024	-0.020	0.004
NP 1329	29.16	22.50	-1.95	-0.275	-0.232	-0.104	0.105	0.012
NR 1331	29.14	67.44	-2.03	-0.415	-0.388	-0.137	0.214	-0.054
NR 1332	29.14	90.00	-2.01	-0.484	-0.441	-0.390	0.505	0.067

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS = R.A.E 3FT*4FT TUNNEL RESULTS.

DP.NO.	ATTITUDE		COEFFICIENTS					
	THETA	PHI	CZ	CM	CX	CY	CN	CL
NR 1287	-0.01	-0.01	0.17	0.155	-0.255	0.018	0.046	-0.014
NR 1333	-0.01	0.00	0.17	0.390	-0.255	0.000	0.028	0.000
NR 1335	-0.01	0.00	0.17	0.160	-0.255	0.000	0.052	0.000

(Run.15)

RUN NUMBER=15 SHORT BODY, SQUARE NOSE, SMALL TAIL
 CANT ANGLE= 0.0 CG POSITION 50.00%
 V= 240. FPS R6= 0.384 MILLION

OP.NO.	ATTITUDE				COEFFICIENTS		CN	CL
	THETA	PHI	C2	CM	CX	CY		
NR 1153	-10.06	-0.01	0.81	0.316	-0.930	0.048	0.031	-0.016
NR 1154	-10.06	22.49	0.74	0.224	-0.931	0.014	0.107	0.016
NR 1155	-10.07	44.99	0.70	0.143	-0.928	0.032	0.108	0.052
NR 1156	-10.09	67.50	0.73	0.109	-0.931	0.097	0.081	0.081
NR 1157	-10.11	89.99	0.78	0.118	-0.930	0.080	0.087	0.081
NR 1162	-5.08	0.00	1.11	0.970	-0.868	0.042	-0.010	-0.009
NR 1161	-5.08	22.59	1.04	0.863	-0.890	-0.241	0.326	0.025
NR 1160	-5.04	45.00	0.35	0.128	-0.892	0.037	0.090	0.061
NR 1159	-5.06	67.50	0.36	0.100	-0.891	0.050	0.102	0.083
NR 1158	-5.08	89.99	0.38	0.062	-0.895	0.060	0.094	0.087
NR 1163	-0.05	0.10	0.70	0.713	-0.865	0.034	-0.027	-0.005
NR 1164	-0.05	22.50	0.65	0.657	-0.856	-0.254	0.330	0.034
NR 1165	-0.05	45.00	0.49	0.463	-0.866	-0.487	0.612	0.064
NR 1166	-0.05	67.50	0.25	0.173	-0.864	-0.634	0.787	0.085
NR 1167	-0.05	90.00	-0.03	-0.152	-0.864	-0.690	0.862	0.093
NR 1172	4.98	0.00	0.32	0.519	-0.896	0.027	-0.015	-0.002
NR 1171	4.98	22.50	0.27	0.454	-0.894	-0.266	0.334	0.029
NR 1170	4.98	45.00	0.10	0.251	-0.893	-0.493	0.612	0.062
NR 1169	4.98	67.50	-0.15	-0.035	-0.892	-0.645	0.796	0.089
NR 1168	4.99	90.00	-0.42	-0.364	-0.897	-0.710	0.864	0.089
NR 1173	10.01	0.00	-0.08	0.469	-0.937	0.011	-0.005	-0.002
NR 1174	10.01	22.50	-0.10	0.437	-0.936	-0.247	0.314	0.029
NR 1175	10.01	45.00	-0.23	0.271	-0.926	-0.510	0.629	0.066
NR 1176	10.02	67.50	-0.51	-0.064	-0.926	-0.698	0.839	0.092
NR 1177	10.02	90.00	-0.82	-0.424	-0.935	-0.730	0.872	0.092
NR 1182	15.10	-0.01	-1.27	-0.350	-0.946	0.007	0.009	-0.017
NR 1183	15.09	22.49	-1.19	-0.300	-0.974	0.049	0.013	0.013
NR 1184	15.08	44.99	-1.15	-0.302	-0.975	-0.019	0.099	0.055
NR 1185	15.07	67.50	-1.21	-0.395	-0.975	-0.091	0.191	0.084
NR 1186	15.06	89.99	-1.28	-0.493	-0.976	-0.030	0.130	0.079
NR 1192	20.15	-0.01	-1.79	-0.440	-1.007	-0.021	-0.017	-0.009
NR 1193	20.15	0.00	-1.79	-0.440	-1.007	-0.021	-0.009	-0.007
NR 1190	20.14	22.49	-1.68	-0.337	-1.009	0.067	-0.054	0.024
NR 1191	20.14	22.49	-1.69	-0.346	-1.009	0.060	-0.033	0.021
NR 1189	20.13	45.00	-1.64	-0.327	-1.001	-0.038	0.075	0.057
NR 1188	20.12	67.49	-1.68	-0.401	-1.008	-0.156	0.211	0.075
NR 1187	20.11	89.99	-1.78	-0.550	-1.008	-0.060	0.114	0.082
NR 1194	25.18	0.00	-2.16	-0.434	-1.063	-0.024	-0.029	-0.004
NR 1195	25.18	0.00	-2.16	-0.434	-1.063	-0.024	-0.029	-0.004
NR 1196	25.17	22.53	-2.13	-0.395	-1.052	0.042	-0.084	0.090
NR 1197	25.18	22.53	-2.13	-0.383	-1.047	0.025	-0.077	0.087
NR 1198	25.17	44.99	-2.14	-0.441	-1.021	-0.065	0.080	0.046
NR 1199	25.17	44.99	-2.14	-0.426	-1.021	-0.073	0.080	0.049
NR 1200	25.16	67.45	-2.11	-0.414	-1.057	-0.150	0.212	0.066
NR 1201	25.16	67.45	-2.11	-0.424	-1.052	-0.150	0.209	0.065

R=RESULTS IN ROLLING BODY AXES.
 NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E 3FT-4FT TUNNEL RESULTS.

DP.NO.	ATTITUDE				COEFFICIENTS		CN	CL
	THETA	PHI	C2	CM	CX	CY		
NR 1202	25.15	90.00	-2.17	-0.541	-1.072	-0.060	0.107	0.085
NR 1203	25.15	90.00	-2.18	-0.537	-1.077	-0.060	0.114	0.086
NR 1212	29.21	0.10	-2.46	-0.500	-1.077	-0.032	0.010	-0.001
NR 1213	29.20	0.10	-2.46	-0.514	-1.077	-0.031	-0.007	-0.002
NR 1210	29.20	22.57	-2.43	-0.475	-1.062	-0.078	0.002	0.143
NR 1211	29.20	22.57	-2.42	-0.462	-1.062	-0.072	-0.009	0.141
NR 1208	29.19	44.98	-2.39	-0.459	-1.011	-0.074	0.100	0.028
NR 1209	29.19	44.98	-2.39	-0.459	-1.011	-0.074	0.089	0.029
NR 1206	29.19	67.43	-2.41	-0.520	-1.067	-0.072	0.133	-0.043
NR 1207	29.18	67.43	-2.38	-0.498	-1.072	-0.060	0.125	-0.040
NR 1204	29.17	90.00	-2.46	-0.594	-1.073	-0.080	0.131	0.083
NR 1205	29.17	90.00	-2.46	-0.612	-1.078	-0.080	0.138	0.087
NR 1152	0.00	-0.01	0.01	0.049	-0.659	0.061	-0.032	-0.016
NR 1178	-0.05	0.00	0.71	0.736	-0.860	0.031	-0.024	0.003
NR 1181	0.00	-0.01	0.01	0.049	-0.659	0.049	-0.027	-0.020
NR 1214	0.00	0.10	-0.01	0.004	-0.659	0.017	-0.018	-0.001

(Run.21)

RUN NUMBER#21 SHORT BODY, SQUARE NOSE, SMALL TAIL
CANT ANGLE= 5.0 CG POSITION 50.00X
V= 240. FPS RE= 0.384 MILLION

OP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 1547	-10.07	-0.01	0.95	0.434	-0.959	0.007	0.049	-0.021
NR 1548	-10.07	22.48	0.86	0.339	-0.931	-0.071	0.183	0.010
NR 1549	-10.08	44.89	0.75	0.207	-0.943	-0.067	0.219	0.046
NR 1550	-10.09	67.49	0.72	0.130	-0.938	0.007	0.160	0.071
NR 1551	-10.11	89.99	0.74	0.899	-0.930	0.020	0.168	0.074
NR 1552	-10.11	89.98	0.74	0.103	-0.930	0.020	0.132	0.071
NR 1557	-5.04	0.09	0.48	0.292	-0.902	0.014	-0.013	-0.013
NR 1556	-5.04	22.39	0.43	0.243	-0.899	-0.023	0.083	0.018
NR 1555	-5.05	44.99	0.38	0.174	-0.897	-0.029	0.124	0.051
NR 1554	-5.06	67.49	0.35	0.109	-0.896	0.004	0.127	0.073
NR 1553	-5.08	89.99	0.34	0.038	-0.896	0.020	0.127	0.077
NR 1538	0.00	0.09	0.02	-0.003	-0.864	0.011	-0.028	-0.010
NR 1559	0.00	22.49	-0.01	-0.024	-0.882	-0.018	0.053	0.028
NR 1560	-0.01	44.99	-0.02	-0.057	-0.865	-0.032	0.111	0.059
NR 1561	-0.03	67.49	-0.04	-0.112	-0.869	-0.029	0.133	0.078
NR 1562	-0.04	89.99	-0.06	-0.150	-0.869	-0.020	0.158	0.085
NR 1567	5.02	0.00	-0.31	-0.143	-0.900	0.022	-0.034	-0.003
NR 1566	5.02	22.49	-0.34	-0.181	-0.894	-0.028	0.053	0.028
NR 1565	5.01	45.00	-0.39	-0.248	-0.892	-0.036	0.104	0.063
NR 1564	5.00	67.30	-0.43	-0.320	-0.897	-0.026	0.132	0.086
NR 1563	4.99	89.99	-0.44	-0.357	-0.907	-0.020	0.140	0.089
NR 1568	10.05	-0.01	-0.68	-0.171	-0.931	0.001	-0.026	-0.009
NR 1569	10.05	22.49	-0.67	-0.164	-0.931	-0.043	0.072	0.022
NR 1570	10.04	45.00	-0.69	-0.202	-0.930	-0.085	0.153	0.064
NR 1571	10.04	67.50	-0.79	-0.317	-0.933	-0.099	0.202	0.091
NR 1572	10.02	90.00	-0.84	-0.410	-0.943	-0.030	0.156	0.093
NR 1577	15.09	0.00	-1.13	-0.237	-0.939	-0.027	-0.012	-0.008
NR 1576	15.09	22.49	-1.08	-0.193	-0.943	-0.021	0.022	0.020
NR 1575	15.08	45.00	-1.11	-0.228	-0.953	-0.134	0.173	0.068
NR 1574	15.08	67.50	-1.23	-0.361	-0.966	-0.153	0.214	0.094
NR 1573	15.07	90.00	-1.30	-0.470	-0.971	-0.070	0.147	0.093
NR 1578	20.14	0.00	-1.66	-0.314	-0.949	-0.031	-0.031	-0.007
NR 1579	20.13	22.49	-1.56	-0.228	-0.935	-0.003	-0.005	0.017
NR 1580	20.12	43.00	-1.58	-0.257	-0.972	-0.136	0.143	0.067
NR 1581	20.12	67.50	-1.69	-0.380	-0.998	-0.213	0.258	0.088
NR 1582	20.11	90.00	-1.81	-0.527	-1.008	-0.100	0.147	0.094
NR 1589	25.18	0.00	-2.11	-0.374	-1.003	-0.036	-0.025	0.002
NR 1590	25.18	0.00	-2.11	-0.367	-1.000	-0.029	-0.040	0.003
NR 1587	25.17	22.50	-2.06	-0.308	-0.974	0.000	-0.019	0.042
NR 1588	25.17	22.51	-2.05	-0.315	-0.978	0.002	-0.036	0.046
NR 1585	25.16	44.99	-2.04	-0.320	-0.991	-0.164	0.162	0.047
NR 1586	25.16	44.99	-2.04	-0.320	-0.991	-0.164	0.162	0.048
NR 1584	25.16	67.46	-2.10	-0.393	-1.052	-0.244	0.320	0.014
NR 1583	25.15	90.01	-2.18	-0.520	-1.077	-0.110	0.181	0.102

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTO FIN BOMBLETS = R.A.E 3PT-4PT TUNNEL RESULTS.

DP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 1591	29.20	0.00	-2.40	-0.430	-1.023	-0.020	-0.037	0.001
NR 1592	29.20	0.01	-2.39	-0.420	-1.018	-0.021	-0.036	0.009
NR 1593	29.20	22.35	-2.34	-0.364	-0.998	-0.000	-0.071	0.120
NR 1594	29.19	22.55	-2.33	-0.367	-1.003	0.002	-0.079	0.112
NR 1595	29.19	44.96	-2.30	-0.345	-0.987	-0.130	0.181	-0.004
NR 1596	29.19	44.96	-2.30	-0.354	-0.987	-0.134	0.181	-0.004
NR 1597	29.18	67.44	-2.34	-0.444	-1.072	-0.084	0.171	-0.024
NR 1598	29.18	67.44	-2.34	-0.438	-1.072	-0.117	0.201	-0.023
NR 1599	29.17	90.01	-2.44	-0.592	-1.083	-0.120	0.188	0.108
NR 1600	29.17	90.02	-2.45	-0.588	-1.088	-0.139	0.213	0.111
NR 1546	0.00	-0.01	0.06	0.092	-0.854	0.032	-0.034	-0.020
NR 1601	0.00	0.00	0.04	0.071	-0.884	0.019	-0.028	0.002

(Run.18)								
RUN NUMBER=18 SHORT BODY, SQUARE NOSE, SMALL TAIL								
CANT ANGLE=10.0 CG POSITION 50.00%								
V= 240. FPS RE= 0.384 MILLION								
DP.NO.	ATTITUDE	COEFFICIENTS						
	THETA	RNI	CZ	CM	CX	CY	CN	CL
NR 1338	-10.08	0.00	1.10	0.538	-1.019	0.008	0.033	-0.002
NR 1339	-10.08	22.49	0.99	0.419	-1.010	-0.130	0.207	0.023
NR 1340	-10.08	44.99	0.83	0.265	-0.982	-0.160	0.271	0.055
NR 1341	-10.09	67.49	0.75	0.157	-0.965	-0.101	0.230	0.068
NR 1342	-10.11	89.99	0.73	0.117	-0.940	-0.050	0.189	0.076
NR 1347	-5.04	0.00	0.41	0.379	-0.932	0.006	-0.018	-0.005
NR 1346	-5.04	22.49	0.55	0.335	-0.929	-0.085	0.114	0.024
NR 1345	-5.05	44.99	0.44	0.241	-0.912	-0.116	0.191	0.054
NR 1344	-5.06	67.49	0.38	0.157	-0.906	-0.104	0.221	0.072
NR 1343	-5.08	89.99	0.33	0.071	-0.905	-0.060	0.208	0.084
NR 1348	-0.01	0.00	0.10	0.056	-0.869	0.014	-0.046	-0.005
NR 1350	-0.01	22.50	0.07	0.042	-0.867	-0.044	0.065	0.040
NR 1351	-0.02	45.00	0.04	-0.007	-0.870	-0.076	0.139	0.067
NR 1352	-0.03	67.50	-0.01	-0.078	-0.869	-0.082	0.177	0.090
NR 1353	-0.04	90.00	-0.05	-0.144	-0.874	-0.090	0.206	0.097
NR 1358	5.02	0.00	-0.24	-0.081	-0.910	0.011	-0.022	-0.004
NR 1357	5.02	22.49	-0.27	-0.130	-0.903	-0.054	0.087	0.028
NR 1356	5.01	45.00	-0.32	-0.197	-0.902	-0.083	0.147	0.065
NR 1355	5.00	67.51	-0.39	-0.268	-0.907	-0.074	0.167	0.099
NR 1354	4.99	90.01	-0.43	-0.344	-0.921	-0.090	0.204	0.106
NR 1359	10.04	-0.01	-0.53	-0.040	-0.936	0.002	-0.011	-0.008
NR 1364	10.04	-0.01	-0.54	-0.041	-0.936	0.013	0.010	-0.012
NR 1365	10.04	22.49	-0.55	-0.069	-0.936	-0.067	0.128	0.021
NR 1366	10.04	45.00	-0.62	-0.151	-0.935	-0.136	0.233	0.061
NR 1367	10.03	67.50	-0.74	-0.300	-0.945	-0.132	0.251	0.095
NR 1368	10.02	90.00	-0.80	-0.396	-0.965	-0.130	0.247	0.098
NR 1373	15.08	0.00	-0.95	-0.075	-0.939	-0.002	-0.013	-0.006
NR 1372	15.07	22.49	-0.92	-0.047	-0.945	-0.069	0.087	0.027
NR 1371	15.07	45.00	-0.99	-0.125	-0.965	-0.210	0.263	0.068
NR 1370	15.07	67.50	-1.16	-0.324	-0.966	-0.222	0.292	0.094
NR 1369	15.06	90.00	-1.26	-0.449	-0.990	-0.160	0.247	0.102
NR 1374	20.12	-0.01	-1.47	-0.135	-0.929	0.001	-0.040	-0.015
NR 1375	20.12	-0.01	-1.47	-0.142	-0.929	0.001	-0.040	-0.012
NR 1376	20.12	22.49	-1.39	-0.088	-0.936	-0.023	0.029	0.022
NR 1377	20.12	22.49	-1.40	-0.087	-0.936	-0.029	0.027	0.016
NR 1378	20.11	45.01	-1.44	-0.140	-0.967	-0.227	0.249	0.076
NR 1379	20.11	67.50	-1.62	-0.332	-0.998	-0.294	0.333	0.089
NR 1380	20.11	90.00	-1.76	-0.492	-1.023	-0.190	0.232	0.099
NR 1381	20.11	90.01	-1.76	-0.493	-1.023	-0.190	0.224	0.101
NR 1390	25.17	-0.01	-2.02	-0.282	-0.921	0.002	-0.048	-0.014
NR 1392	25.17	-0.01	-2.02	-0.312	-0.926	-0.004	-0.041	-0.016
NR 1388	25.16	22.49	-1.90	-0.190	-0.924	-0.006	0.002	0.020
NR 1389	25.16	22.49	-1.90	-0.176	-0.924	-0.005	0.007	0.015
NR 1386	25.15	45.00	-1.90	-0.204	-0.977	-0.250	0.245	0.060
NR 1387	25.15	45.00	-1.91	-0.200	-0.977	-0.243	0.249	0.062

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E 3FT+4FT TUNNEL RESULTS.

DP.NO.	ATTITUDE	COEFFICIENTS						
	THETA	RNI	CZ	CM	CX	CY	CN	CL
NR 1384	25.15	67.45	-2.03	-0.335	-1.067	-0.225	0.282	0.002
NR 1385	25.15	67.45	-2.03	-0.344	-1.062	-0.225	0.303	0.006
NR 1382	25.14	90.01	-2.13	-0.494	-1.087	-0.200	0.250	0.102
NR 1383	25.14	90.01	-2.13	-0.478	-1.092	-0.190	0.232	0.101
NR 1393	29.19	0.00	-2.30	-0.343	-0.964	-0.020	-0.021	0.005
NR 1394	29.19	0.00	-2.30	-0.350	-0.969	-0.020	-0.021	0.002
NR 1395	29.19	22.50	-2.22	-0.301	-0.924	0.022	-0.034	0.037
NR 1396	29.19	22.51	-2.22	-0.298	-0.924	0.024	-0.059	0.044
NR 1397	29.18	44.97	-2.20	-0.283	-0.962	-0.194	0.224	0.003
NR 1398	29.18	44.97	-2.19	-0.274	-0.957	-0.208	0.209	0.004
NR 1399	29.17	67.44	-2.28	-0.409	-1.077	-0.156	0.215	-0.013
NR 1400	29.18	67.44	-2.29	-0.411	-1.072	-0.161	0.225	-0.012
NR 1401	29.17	90.01	-2.42	-0.590	-1.097	-0.190	0.244	0.101
NR 1402	29.17	90.01	-2.42	-0.574	-1.092	-0.190	0.244	0.102
NR 1337	-0.01	0.00	0.12	0.115	-0.869	0.014	-0.015	-0.005
NR 1360	-0.01	0.00	0.12	0.130	-0.874	0.026	-0.026	-0.001
NR 1363	-0.01	-0.01	0.13	0.150	-0.874	0.050	-0.020	-0.018
NR 1404	-0.01	0.00	0.12	0.115	-0.869	0.025	-0.017	0.001

(Run.34-37)

RUN NUMBER=34 SHORT BODY, ROUND NOSE, NO FINS
CG POSITION 50.00%
V= 240, PPS RS= 0.384 MILLION

DP.NO.	ATTITUDE		C2	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 2521	-10.03	-0.01	0.38	-0.200	-0.244	0.032	0.032	-0.009
NR 2522	-5.02	0.10	0.18	-0.101	-0.218	0.019	0.032	0.158
NR 2523	0.00	0.10	-0.02	0.011	-0.191	0.018	0.020	0.159
NR 2524	5.02	0.10	-0.21	0.135	-0.218	0.017	-0.000	0.160
NR 2525	10.04	0.10	-0.37	0.265	-0.244	0.016	0.005	0.158
NR 2526	15.05	0.10	-0.54	0.580	-0.265	0.003	-0.002	0.160
NR 2527	20.07	0.10	-0.70	0.479	-0.276	0.002	-0.013	0.162
NR 2528	25.09	0.10	-0.88	0.531	-0.275	-0.005	-0.009	0.160
NR 2529	29.10	0.10	-1.03	0.568	-0.250	-0.012	-0.020	0.161
NR 2530	0.00	-0.01	0.01	0.057	-0.191	0.024	0.014	-0.013
NR 2530	0.00	0.10	-0.02	-0.005	-0.196	0.000	0.023	0.165

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

RUN NUMBER=35 SHORT BODY, SQUARE NOSE, NO FINS
CG POSITION 50.00%
V= 240, PPS RS= 0.384 MILLION

DP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 2534	-10.03	-0.01	0.39	-0.029	-0.932	0.020	0.050	-0.011
NR 2535	-5.02	-0.01	0.21	0.107	-0.891	0.019	0.022	-0.010
NR 2536	0.00	0.00	0.00	0.051	-0.849	0.018	0.015	-0.007
NR 2537	5.02	0.00	-0.22	-0.043	-0.891	0.022	0.014	-0.008
NR 2538	10.04	-0.01	-0.40	0.072	-0.939	-0.035	0.052	-0.009
NR 2539	15.05	0.00	-0.58	0.274	-0.992	0.025	-0.016	-0.003
NR 2540	20.08	0.00	-0.88	0.411	-1.023	-0.014	-0.007	-0.004
NR 2541	20.08	0.00	-0.88	0.396	-1.028	-0.014	-0.007	-0.006
NR 2542	25.11	-0.01	-1.21	0.466	-1.056	-0.016	-0.028	-0.008
NR 2543	25.11	0.00	-1.21	0.459	-1.056	-0.010	-0.026	-0.008
NR 2544	29.13	0.00	-1.43	0.437	-1.046	-0.019	-0.015	-0.008
NR 2545	29.13	0.00	-1.43	0.452	-1.051	-0.006	-0.026	-0.007
NR 2546	0.00	0.00	-0.01	0.020	-0.849	0.018	-0.011	0.001

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

RUN NUMBER=36 LONG BODY, SQUARE NOSE, NO FINS
CG POSITION 50.00%
V= 240, PPS RE= 0.584 MILLION

DP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 2551	-10.03	0.00	0.45	-0.295	-0.898	0.022	0.012	-0.001
NR 2552	-5.02	0.00	0.22	-0.044	-0.862	0.008	0.000	-0.001
NR 2553	0.00	0.00	-0.02	0.030	-0.850	0.012	-0.001	-0.005
NR 2554	5.02	0.00	-0.25	0.110	-0.881	0.016	-0.005	-0.001
NR 2555	10.04	0.00	-0.49	0.551	-0.928	0.008	-0.014	-0.004
NR 2556	15.07	0.00	-0.79	0.619	-0.977	0.000	-0.019	-0.004
NR 2557	15.07	0.00	-0.79	0.605	-0.977	-0.024	-0.035	-0.006
NR 2558	20.10	-0.01	-1.23	0.872	-1.022	-0.042	-0.005	-0.009
NR 2559	20.10	-0.01	-1.25	0.864	-1.027	-0.047	-0.029	-0.012
NR 2560	25.14	-0.01	-1.79	0.969	-1.060	-0.048	-0.142	-0.013
NR 2561	25.14	-0.01	-1.78	0.972	-1.060	-0.064	-0.030	-0.014
NR 2565	28.17	-0.01	-2.09	0.969	-1.055	-0.042	-0.063	-0.015
NR 2564	28.17	-0.01	-2.08	0.978	-1.048	-0.043	-0.025	-0.013
NR 2550	0.00	0.00	-0.02	0.022	-0.835	0.012	-0.009	-0.002
NR 2565	0.00	0.00	-0.02	0.050	-0.855	0.050	0.006	0.001

RUN NUMBER=37 LONG BODY, ROUND NOSE, NO FINS
CG POSITION 50.00%
V= 240, PPS RS= 0.384 MILLION

DP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
	THETA	PHI			CX	CY		
NR 2569	-10.03	0.00	0.39	-0.551	-0.196	0.015	0.016	-0.001
NR 2570	-5.02	0.00	0.19	-0.260	-0.184	0.007	0.012	-0.003
NR 2571	0.00	0.00	-0.01	0.015	-0.167	0.000	0.000	-0.003
NR 2572	5.02	0.00	-0.25	0.288	-0.194	0.011	-0.021	0.000
NR 2573	10.04	0.00	-0.42	0.569	-0.221	0.009	-0.026	-0.002
NR 2574	15.06	0.00	-0.65	0.763	-0.255	0.013	-0.050	-0.002
NR 2575	20.08	0.00	-0.95	0.869	-0.226	0.023	-0.040	-0.004
NR 2576	25.11	0.00	-1.50	0.940	-0.201	0.033	-0.058	-0.004
NR 2577	29.13	0.00	-1.61	0.960	-0.159	0.050	-0.066	-0.007
NR 2568	0.00	0.00	-0.01	0.025	-0.167	0.000	0.008	-0.001
NR 2578	0.00	0.00	-0.02	0.057	-0.167	0.018	0.006	0.001

(Run.40)

RUN NUMBER=40 LONG BODY, ROUND NOSE, CURVED TAIL A
CANT ANGLE= 0.0 DEG. CG POSITION 50.00%
V= 240, FPM RE= 0.384 MILLION

	DP.NO.	ATTITUDE		COEFFICIENTS				CL
		THETA	PHI	CZ	CM	CX	CY	
NR	2582	-10.08	0.05	1.49	1.632	-0.274	8.052	0.042
NR	2583	-10.08	0.03	1.49	1.640	-0.274	0.058	0.042
NR	2584	-10.08	22.52	1.45	1.576	-0.245	-0.001	0.057
NR	2585	-10.10	45.03	1.43	1.503	-0.235	0.039	0.076
NR	2586	-10.12	67.52	1.43	1.501	-0.255	0.103	0.070
NR	2587	-10.14	90.01	1.45	1.470	-0.260	0.090	0.059
NR	2592	-5.04	0.02	0.70	0.725	-0.255	0.038	0.055
NR	2591	-5.04	22.52	0.67	0.673	-0.245	0.019	0.054
NR	2590	-5.05	45.02	0.63	0.597	-0.244	0.045	0.067
NR	2589	-5.07	67.52	0.62	0.573	-0.244	0.063	0.076
NR	2588	-5.09	90.01	0.64	0.577	-0.249	0.070	0.068
NR	2593	0.00	0.02	-0.06	-0.033	-0.255	-0.021	0.041
NR	2594	0.00	22.52	-0.09	-0.060	-0.254	-0.029	0.045
NR	2595	-0.01	45.02	-0.11	-0.100	-0.253	-0.013	0.058
NR	2596	-0.03	67.52	-0.12	-0.141	-0.253	-0.006	0.068
NR	2597	-0.05	90.11	-0.13	-0.186	-0.253	0.010	0.067
NR	2602	5.05	0.01	-0.83	-0.844	-0.265	-0.049	0.111
NR	2601	5.04	22.51	-0.84	-0.846	-0.263	-0.046	0.118
NR	2600	5.03	45.01	-0.84	-0.828	-0.262	-0.050	0.160
NR	2599	5.02	67.52	-0.86	-0.879	-0.262	-0.052	0.207
NR	2598	5.00	90.11	-0.89	-0.955	-0.262	-0.028	0.153
NR	2603	10.09	0.00	-1.56	-1.668	-0.285	-0.056	0.140
NR	2604	10.08	22.50	-1.57	-1.661	-0.264	-0.023	0.074
NR	2605	10.08	45.00	-1.61	-1.689	-0.262	-0.081	0.217
NR	2606	10.06	67.51	-1.62	-1.740	-0.285	-0.096	0.307
NR	2607	10.05	90.01	-1.63	-1.786	-0.290	-0.050	0.192
NR	2615	15.11	0.06	-1.97	-1.788	-0.321	-0.139	0.256
NR	2616	15.11	0.06	-1.97	-1.788	-0.326	-0.146	0.272
NR	2613	15.12	22.54	-2.15	-2.155	-0.270	-0.094	0.165
NR	2614	15.12	22.54	-2.14	-2.133	-0.270	-0.091	0.173
NR	2612	15.12	45.03	-2.29	-2.412	-0.253	-0.056	0.165
NR	2610	15.10	67.50	-2.09	-2.040	-0.298	-0.011	0.119
NR	2611	15.10	67.51	-2.09	-2.032	-0.303	-0.010	0.115
NR	2608	15.08	90.06	-2.04	-1.960	-0.332	-0.098	0.290
NR	2609	15.08	90.06	-2.04	-1.944	-0.332	-0.108	0.290
NR	2617	20.14	0.10	-2.36	-1.828	-0.384	-0.255	0.484
NR	2618	20.14	0.10	-2.37	-1.854	-0.365	-0.247	0.429
NR	2619	20.15	22.64	-2.49	-2.084	-0.342	-0.494	0.944
NR	2620	20.15	22.64	-2.49	-2.106	-0.352	-0.504	0.960
NR	2621	20.15	45.10	-2.85	-2.886	-0.253	-0.032	0.134
NR	2622	20.15	45.10	-2.85	-2.891	-0.255	-0.032	0.129
NR	2623	20.12	67.58	-2.43	-2.049	-0.338	-0.107	0.288
NR	2624	20.12	67.58	-2.43	-2.047	-0.342	-0.107	0.271
NR	2625	20.11	90.07	-2.47	-2.104	-0.348	-0.097	0.232
NR	2626	20.11	90.07	-2.47	-2.105	-0.343	-0.097	0.217

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E 3FT*4FT TUNNEL RESULTS.

	DP.NO.	ATTITUDE		COEFFICIENTS				CL
		THETA	PHI	CZ	CM	CX	CY	
NR	2635	25.17	0.08	-2.77	-1.944	-0.417	-0.199	0.364
NR	2636	25.17	0.08	-2.78	-1.959	-0.412	-0.199	0.372
NR	2633	25.17	22.62	-2.69	-1.883	-0.424	-0.483	0.930
NR	2634	25.17	22.62	-2.68	-1.877	-0.424	-0.487	0.941
NR	2631	25.19	45.34	-3.26	-2.958	-0.317	-0.481	1.081
NR	2632	25.19	45.34	-3.26	-2.963	-0.307	-0.481	1.054
NR	2629	25.16	67.57	-2.90	-2.363	-0.336	-0.061	0.177
NR	2630	25.16	67.57	-2.89	-2.359	-0.345	-0.059	0.167
NR	2627	25.14	90.08	-2.80	-1.994	-0.425	-0.136	0.279
NR	2628	25.14	90.09	-2.80	-1.978	-0.426	-0.136	0.286
NR	2581	0.00	0.02	-0.05	-0.032	-0.255	-0.028	0.042
NR	2638	0.00	0.02	-0.06	-0.033	-0.255	-0.021	0.031

(Run.41)

RUN NUMBER=41 LONG BODY, SQUARE NOSE, CURVED TAIL 4
 CANT ANGLE= 0.0 DEG. CG POSITION 30.00X
 V= 240. FPS RB= 0.384 MILLION

DP.NO.	ATTITUDE					COEFFICIENTS		CN	CL
	THETA	PHI	CZ	CM		CX	CY		
NR 2642	-10.08	0.03	1.34	1.857		-0.950	0.055	-0.117	0.047
NR 2643	-10.08	0.05	1.54	1.849		-0.930	0.054	-0.125	0.044
NR 2644	-10.08	22.32	1.48	1.745		-0.930	-0.017	0.043	0.051
NR 2645	-10.08	22.82	1.47	1.722		-0.950	-0.015	0.083	0.050
NR 2646	-10.10	45.02	1.40	1.371		-0.920	0.046	-0.076	0.070
NR 2647	-10.10	45.02	1.40	1.366		-0.920	0.046	-0.070	0.070
NR 2649	-10.12	67.52	1.42	1.640		-0.936	0.156	-0.197	0.079
NR 2650	-10.14	90.01	1.46	1.688		-0.941	0.100	-0.064	0.064
NR 2636	-3.04	0.00	0.72	0.884		-0.915	0.023	-0.094	0.021
NR 2635	-3.04	22.50	0.67	0.858		-0.914	0.029	-0.052	0.029
NR 2634	-5.03	45.02	0.65	0.790		-0.914	0.059	-0.004	0.056
NR 2633	-5.07	67.52	0.65	0.763		-0.914	0.055	0.002	0.071
NR 2632	-5.08	90.00	0.64	0.753		-0.914	0.070	-0.002	0.061
NR 2637	0.00	0.00	-0.06	-0.034		-0.894	-0.029	0.004	0.009
NR 2638	0.00	22.51	-0.09	-0.075		-0.897	-0.029	0.070	0.028
NR 2639	-0.01	43.01	-0.11	-0.111		-0.901	-0.025	0.105	0.041
NR 2660	-0.03	67.51	-0.12	-0.164		-0.901	-0.017	0.116	0.030
NR 2661	-0.03	90.00	-0.12	-0.214		-0.901	-0.010	0.110	0.032
NR 2666	5.04	0.10	-0.85	-0.974		-0.926	-0.065	0.156	0.002
NR 2665	5.04	22.50	-0.84	-0.977		-0.929	-0.070	0.166	0.013
NR 2664	5.03	43.00	-0.84	-0.972		-0.933	-0.063	0.204	0.036
NR 2663	3.00	67.50	-0.88	-1.065		-0.937	-0.049	0.216	0.058
NR 2662	5.00	90.00	-0.90	-1.156		-0.937	-0.040	0.172	0.051
NR 2667	10.09	0.10	-1.64	-1.893		-0.945	-0.075	0.130	0.005
NR 2668	10.09	22.50	-1.65	-1.816		-0.948	-0.053	0.070	0.009
NR 2669	10.08	43.00	-1.61	-1.732		-0.931	-0.097	0.264	0.033
NR 2670	10.06	67.51	-1.66	-1.907		-0.969	-0.158	0.401	0.049
NR 2671	10.03	90.01	-1.71	-2.034		-0.979	-0.060	0.203	0.056
NR 2680	13.12	0.08	-2.18	-2.069		-1.029	-0.141	0.508	0.123
NR 2681	15.12	0.08	-2.17	-2.084		-1.029	-0.141	0.308	0.128
NR 2678	15.13	22.60	-2.32	-2.285		-0.988	-0.108	0.198	0.179
NR 2679	15.13	22.60	-2.51	-2.273		-0.995	-0.107	0.210	0.178
NR 2676	15.13	43.00	-2.42	-2.471		-0.961	-0.101	0.225	0.032
NR 2677	13.12	43.00	-2.40	-2.464		-0.961	-0.107	0.250	0.037
NR 2674	15.11	67.47	-2.50	-2.317		-1.010	-0.088	0.242	-0.016
NR 2675	15.11	67.47	-2.31	-2.518		-1.019	-0.095	0.240	-0.016
NR 2672	15.09	90.07	-2.26	-2.249		-1.033	-0.127	0.271	0.165
NR 2673	15.09	90.07	-2.26	-2.249		-1.039	-0.127	0.271	0.163
NR 2682	20.17	0.11	-2.79	-2.152		-1.072	-0.230	0.567	0.175
NR 2683	20.17	0.10	-2.77	-2.151		-1.081	-0.231	0.407	0.161
NR 2684	20.18	22.72	-2.93	-2.348		-1.095	-0.408	0.812	0.370

R=RESULTS IN ROLLING BODY AXES.
 NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED PIN BOMBLETS - R.A.E. 5FT-6FT TUNNEL RESULTS.

DP.NO.	ATTITUDE					COEFFICIENTS		CN	CL
	THETA	PHI	CZ	CM		CX	CY		
NR 2685	20.18	22.72	-2.93	-2.342		-1.093	-0.407	0.797	0.381
NR 2686	20.18	44.97	-3.19	-2.951		-0.980	0.103	-0.193	-0.026
NR 2687	20.18	44.97	-3.18	-2.934		-0.980	0.083	-0.199	-0.023
NR 2688	20.16	67.49	-2.96	-2.524		-1.044	-0.122	0.250	0.014
NR 2689	20.16	67.50	-2.97	-2.346		-1.059	-0.158	0.223	0.033
NR 2690	20.13	90.10	-2.85	-2.260		-1.093	-0.195	0.299	0.203
NR 2691	20.13	90.09	-2.84	-2.243		-1.089	-0.196	0.291	0.194
NR 2700	25.22	0.10	-3.52	-2.403		-1.107	-0.185	0.275	0.162
NR 2701	25.22	0.10	-3.52	-2.395		-1.107	-0.191	0.337	0.168
NR 2698	25.23	22.78	-3.69	-2.511		-1.138	-0.540	0.944	0.480
NR 2699	25.23	22.78	-3.69	-2.556		-1.145	-0.540	0.935	0.470
NR 2696	25.23	43.10	-3.88	-3.053		-1.006	-0.149	0.261	0.194
NR 2697	25.23	45.10	-3.86	-3.022		-1.011	-0.132	0.261	0.189
NR 2694	25.21	67.46	-3.78	-2.925		-1.051	-0.031	-0.009	-0.036
NR 2695	25.21	67.45	-3.76	-2.888		-1.061	-0.055	0.054	-0.030
NR 2692	25.19	90.11	-3.59	-2.332		-1.115	-0.215	0.322	0.227
NR 2693	25.19	90.11	-3.60	-2.532		-1.115	-0.205	0.350	0.217
NR 2641	0.00	0.01	-0.07	-0.057		-0.894	-0.059	0.019	0.015
NR 2702	0.00	0.01	-0.07	-0.049		-0.899	-0.020	0.018	0.019

R=RESULTS IN ROLLING BODY AXES.
 NR=RESULTS IN NON-ROLLING BODY AXES.

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(Run.42)

		RUN NUMBER=42 SHORT BODY, SQUARE NOSE, CURVED TAIL A							
		CANT ANGLE= 0.0				CG POSITION 50.00%			
		V= 240, FPS				RE= 0.584 MILLION			
	OP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
		THETA	PHI			CX	CY		
NR	2706	-10.12	45.01	1.27	0.834	-0.965	-1.079	0.775	0.014
NR	2707	-10.12	67.50	1.20	0.669	-0.958	-1.039	0.723	0.042
NR	2708	-10.14	90.01	1.20	0.624	-0.949	-0.980	0.620	0.093
NR	2709	-10.16	112.52	1.25	0.670	-0.962	-0.971	0.598	0.140
NR	2710	-10.19	135.02	1.29	0.679	-0.961	-1.053	0.664	0.145
NR	2715	-5.06	0.00	0.81	0.586	-0.951	0.104	-0.064	0.007
NR	2716	-5.06	22.50	0.78	0.535	-0.928	0.096	0.008	0.050
NR	2713	-5.08	45.00	0.77	0.500	-0.930	0.110	0.016	0.089
NR	2712	-5.10	67.51	0.80	0.482	-0.938	0.102	0.043	0.120
NR	2711	-5.12	90.00	0.82	0.463	-0.938	0.110	0.041	0.124
NR	2716	0.00	0.00	-0.05	-0.059	-0.918	0.061	-0.047	0.000
NR	2717	0.00	22.50	-0.05	-0.061	-0.916	0.041	0.019	0.047
NR	2718	-0.01	45.00	-0.05	-0.089	-0.919	0.030	0.074	0.085
NR	2719	-0.05	67.50	-0.06	-0.137	-0.913	0.018	0.112	0.113
NR	2720	-0.05	90.00	-0.06	-0.166	-0.915	0.020	0.109	0.118
NR	2725	5.06	0.11	-0.89	-0.648	-0.934	-0.002	0.005	0.014
NR	2724	5.06	22.50	-0.87	-0.651	-0.929	-0.019	0.075	0.051
NR	2723	5.05	45.00	-0.86	-0.652	-0.923	-0.038	0.138	0.086
NR	2722	5.05	67.50	-0.89	-0.727	-0.928	-0.065	0.187	0.113
NR	2721	5.02	90.00	-0.92	-0.795	-0.935	-0.070	0.191	0.117
NR	2726	10.12	0.12	-1.68	-1.157	-0.971	-0.026	0.018	0.026
NR	2727	10.12	22.50	-1.63	-1.054	-0.957	-0.040	0.049	0.042
NR	2728	10.11	45.00	-1.60	-1.014	-0.948	-0.102	0.179	0.087
NR	2729	10.09	67.51	-1.64	-1.154	-0.958	-0.156	0.252	0.125
NR	2750	10.08	90.01	-1.70	-1.245	-0.973	-0.120	0.208	0.150
NR	2738	15.16	0.10	-2.07	-1.182	-1.039	-0.117	0.090	0.157
NR	2734	15.16	0.09	-2.08	-1.191	-1.059	-0.118	0.090	0.151
NR	2736	15.17	22.56	-2.33	-1.589	-0.972	-0.076	0.054	0.135
NR	2737	15.17	22.55	-2.51	-1.589	-0.977	-0.068	0.041	0.125
NR	2734	15.17	45.12	-2.55	-1.589	-0.944	-0.112	0.189	0.119
NR	2755	15.17	45.12	-2.35	-1.577	-0.944	-0.112	0.200	0.116
NR	2752	15.14	67.55	-2.11	-1.241	-1.013	-0.058	0.184	0.155
NR	2733	15.14	67.53	-2.11	-1.244	-1.015	-0.058	0.177	0.153
NR	2731	15.12	90.11	-2.08	-1.269	-1.038	-0.206	0.275	0.287
NR	2740	20.19	0.10	-2.44	-1.094	-1.118	-0.120	0.070	0.167
NR	2741	20.19	0.11	-2.44	-1.094	-1.114	-0.126	0.077	0.174
NR	2742	20.21	22.67	-2.66	-1.263	-1.048	-0.454	0.415	0.318
NR	2745	20.21	22.68	-2.67	-1.264	-1.048	-0.450	0.407	0.329
NR	2744	20.22	44.99	-2.95	-1.576	-0.976	-0.190	-0.116	0.056
NR	2745	20.22	44.98	-2.93	-1.562	-0.976	-0.176	-0.091	0.055
NR	2746	20.17	67.61	-2.50	-1.202	-1.076	-0.153	0.251	0.286
NR	2747	20.17	67.61	-2.50	-1.195	-1.071	-0.144	0.265	0.277
NR	2748	20.15	90.12	-2.46	-1.187	-1.121	-0.255	0.294	0.503
NR	2749	20.15	90.11	-2.46	-1.179	-1.116	-0.245	0.284	0.299
NR	2758	25.23	0.12	-2.87	-1.126	-1.186	-0.154	0.099	0.197

NR=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E 5FT-4FT TUNNEL RESULTS.

	DP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
		THETA	PHI			CX	CY		
NR	2759	25.23	0.12	-2.87	-1.141	-1.186	-0.147	0.084	0.195
NR	2756	25.24	22.71	-5.08	-1.510	-1.083	-0.526	0.464	0.592
NR	2757	25.24	22.72	-3.09	-1.312	-1.078	-0.527	0.461	0.397
NR	2754	25.26	45.02	-3.45	-1.716	-0.967	0.275	-0.209	0.111
NR	2755	25.26	45.02	-3.45	-1.706	-0.967	0.273	-0.198	0.104
NR	2752	25.22	67.57	-3.00	-1.502	-1.127	0.026	0.089	0.214
NR	2753	25.22	67.58	-3.00	-1.309	-1.127	0.027	0.076	0.224
NR	2750	25.19	90.12	-2.85	-1.204	-1.186	-0.264	0.504	0.508
NR	2751	25.19	90.12	-2.85	-1.210	-1.181	-0.264	0.515	0.506
NR	2760	29.26	0.15	-5.19	-1.258	-1.188	-0.120	0.068	0.208
NR	2761	29.26	0.13	-5.19	-1.256	-1.188	-0.126	0.075	0.208
NR	2762	29.27	22.78	-5.43	-1.466	-1.071	-0.608	0.502	0.503
NR	2763	29.27	22.78	-3.45	-1.465	-1.066	-0.624	0.555	0.498
NR	2764	29.28	45.08	-3.68	-1.753	-0.961	0.259	-0.186	0.206
NR	2765	29.28	45.08	-5.68	-1.765	-0.956	0.259	-0.185	0.201
NR	2766	29.25	67.54	-3.54	-1.425	-1.126	0.179	-0.055	0.164
NR	2767	29.25	67.54	-3.34	-1.444	-1.121	0.177	-0.063	0.159
NR	2768	29.22	90.14	-3.17	-1.345	-1.180	-0.252	0.514	0.529
NR	2769	29.22	90.14	-5.17	-1.328	-1.175	-0.242	0.519	0.550
NR	2705	0.00	-0.01	-0.02	0.010	-0.913	0.079	-0.058	-0.009
NR	2770	0.00	0.00	-0.05	-0.021	-0.918	0.048	-0.034	0.005

(Run.43)

RUN NUMBER=43 SHORT BODY, ROUND NOSE, CURVED TAIL A
 CANT ANGLE= 0.0 CG POSITION 50.00%
 V= 240. FPS RE= 0.384 MILLION

	OP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
		THETA	PMI			CX	CY		
NR	2774	-10.11	0.01	1.56	0.912	-0.505	0.085	-0.012	0.011
NR	2775	-10.12	22.51	1.50	0.807	-0.300	0.041	0.068	0.055
NR	2776	-10.13	45.01	1.50	0.761	-0.296	0.097	-0.000	0.093
NR	2777	-10.15	67.52	1.48	0.742	-0.309	0.149	-0.065	0.125
NR	2778	-10.18	90.01	1.50	0.753	-0.313	0.100	-0.012	0.127
NR	2783	-5.06	0.02	0.74	0.567	-0.293	0.084	-0.048	0.050
NR	2782	-5.06	22.52	0.72	0.553	-0.294	0.058	0.009	0.072
NR	2781	-5.07	45.02	0.70	0.298	-0.296	0.065	0.005	0.105
NR	2780	-5.09	67.52	0.70	0.281	-0.295	0.073	0.000	0.128
NR	2779	-5.11	90.02	0.71	0.271	-0.294	0.060	0.010	0.129
NR	2784	0.00	0.02	-0.03	-0.023	-0.289	0.055	-0.023	0.028
NR	2786	0.00	22.52	-0.05	-0.047	-0.287	0.029	0.005	0.074
NR	2787	-0.01	45.02	-0.06	-0.073	-0.286	0.011	0.026	0.104
NR	2788	-0.03	67.52	-0.07	-0.087	-0.290	0.003	0.025	0.128
NR	2789	-0.05	90.02	-0.08	-0.095	-0.290	0.000	0.027	0.156
NR	2794	5.06	0.02	-0.80	-0.426	-0.291	0.029	-0.020	0.028
NR	2793	5.06	22.52	-0.78	-0.412	-0.286	0.014	-0.005	0.073
NR	2792	5.04	45.02	-0.78	-0.391	-0.280	-0.030	0.039	0.109
NR	2791	5.03	67.52	-0.81	-0.423	-0.290	-0.063	0.070	0.126
NR	2790	5.01	90.02	-0.84	-0.462	-0.290	-0.050	0.065	0.129
NR	2795	10.12	0.01	-1.56	-0.884	-0.503	0.016	-0.015	0.024
NR	2796	10.11	22.51	-1.54	-0.847	-0.289	0.024	-0.032	0.061
NR	2797	10.11	45.01	-1.56	-0.857	-0.280	-0.075	0.086	0.091
NR	2798	10.09	67.51	-1.58	-0.893	-0.296	-0.124	0.159	0.116
NR	2799	10.08	90.01	-1.61	-0.952	-0.306	-0.100	0.097	0.120
NR	2804	15.14	0.07	-1.84	-0.882	-0.532	-0.049	0.058	0.110
NR	2806	15.15	45.05	-2.15	-1.169	-0.251	-0.060	0.123	0.158
NR	2807	15.12	67.56	-1.85	-0.924	-0.321	-0.029	0.124	0.188
NR	2808	15.12	67.56	-1.85	-0.920	-0.326	-0.038	0.154	0.197
NR	2809	15.10	90.08	-1.89	-0.998	-0.551	-0.167	0.194	0.227
NR	2810	15.10	90.08	-1.88	-0.989	-0.531	-0.167	0.194	0.250
NR	2818	20.17	0.15	-2.16	-0.945	-0.388	-0.340	0.275	0.245
NR	2819	20.17	0.15	-2.16	-0.937	-0.388	-0.339	0.274	0.242
NR	2816	20.16	22.50	-2.05	-0.821	-0.580	-0.086	0.079	0.045
NR	2817	20.16	22.51	-2.05	-0.810	-0.580	-0.085	0.075	0.048
NR	2815	20.18	45.18	-2.39	-1.191	-0.517	0.021	-0.012	0.560
NR	2815	20.14	67.65	-2.10	-0.919	-0.383	-0.290	0.350	0.530
NR	2814	20.14	67.65	-2.10	-0.922	-0.383	-0.292	0.360	0.332
NR	2811	20.13	90.16	-2.20	-1.046	-0.578	-0.444	0.456	0.558
NR	2812	20.15	90.16	-2.20	-1.038	-0.583	-0.454	0.447	0.564
NR	2820	25.19	0.10	-2.37	-0.903	-0.430	0.058	-0.076	0.162
NR	2821	25.19	0.10	-2.37	-0.903	-0.430	0.058	-0.076	0.165
NR	2822	25.19	22.59	-2.39	-0.913	-0.570	-0.306	0.272	0.179
NR	2823	25.19	22.59	-2.39	-0.912	-0.570	-0.312	0.271	0.177
NR	2824	25.22	45.22	-2.91	-1.487	-0.214	-0.030	0.017	0.421

R=RESULTS IN ROLLING BODY AXES.
 NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E 5FT-4FT TUNNEL RESULTS.

DP.NO.		ATTITUDE		COEFFICIENTS					
		THETA	PHI	CZ	CM	CX	CY	CN	CL
NR	2825	25.18	67.62	-2.58	-1.115	-0.349	-0.165	0.208	0.285
NR	2826	25.18	67.62	-2.58	-1.110	-0.354	-0.163	0.216	0.281
NR	2827	25.15	90.11	-2.56	-0.927	-0.453	-0.125	0.126	0.266
NR	2828	25.15	90.11	-2.56	-0.922	-0.458	-0.125	0.126	0.267
NR	2835	29.22	0.15	-2.73	-1.092	-0.432	0.006	-0.048	0.205
NR	2832	29.22	22.64	-2.70	-1.055	-0.554	-0.457	0.590	0.269
NR	2831	29.24	45.13	-3.09	-1.465	-0.222	0.341	-0.308	0.284
NR	2830	29.21	67.59	-2.87	-1.232	-0.553	0.027	0.026	0.226
NR	2829	29.18	90.13	-2.70	-1.088	-0.418	-0.154	0.124	0.505
NR	2800	0.00	0.02	-0.04	-0.055	-0.289	0.047	-0.025	0.031
NR	2803	0.00	0.02	-0.03	0.016	-0.284	0.040	0.006	0.026
NR	2834	0.00	0.02	-0.04	-0.018	-0.284	0.047	-0.017	0.031

(Run.44)

RUN NUMBER=44 SHORT BODY, ROUND NOSE, CURVED TAIL B								
CANT ANGLE= 0.0 CG POSITION 50.00%								
V= 240. FPS RE= 0.384 MILLION								
DP.NO.	ATTITUDE				COEFFICIENTS			
	THETA	PHI	CZ	CM	CX	CY	CN	CL
NR 2838	-10.12	0.00	1.57	0.900	-0.305	0.188	-0.079	0.001
NR 2839	-10.12	22.50	1.60	0.865	-0.305	0.120	0.014	0.045
NR 2840	-10.14	44.99	1.62	0.830	-0.306	0.090	0.020	0.061
NR 2841	-10.16	67.48	1.58	0.798	-0.314	0.049	-0.002	0.069
NR 2842	-10.18	89.98	1.55	0.790	-0.323	-0.009	0.055	0.077
NR 2847	-5.06	0.00	0.76	0.358	-0.297	0.140	-0.082	-0.007
NR 2846	-5.06	22.49	0.78	0.358	-0.299	0.096	-0.026	0.032
NR 2845	-5.08	45.00	0.78	0.352	-0.301	0.074	0.003	0.066
NR 2844	-5.10	67.49	0.78	0.340	-0.299	0.042	0.018	0.086
NR 2843	-5.12	89.99	0.76	0.314	-0.299	0.010	0.038	0.088
NR 2848	0.00	-0.01	-0.02	-0.021	-0.299	0.098	-0.077	-0.009
NR 2849	0.00	22.50	-0.02	-0.025	-0.297	0.048	-0.033	0.033
NR 2850	-0.02	45.00	-0.01	-0.030	-0.296	0.045	-0.014	0.066
NR 2851	-0.03	67.50	-0.01	-0.035	-0.295	0.027	0.011	0.089
NR 2852	-0.05	90.00	-0.02	-0.036	-0.295	0.000	0.027	0.097
NR 2857	5.06	0.00	-0.79	-0.408	-0.301	0.055	-0.071	-0.006
NR 2856	5.06	22.50	-0.78	-0.389	-0.300	0.048	-0.066	0.032
NR 2855	5.04	44.99	-0.79	-0.376	-0.290	0.032	-0.026	0.065
NR 2854	5.03	67.49	-0.79	-0.385	-0.290	0.008	0.022	0.085
NR 2853	5.01	89.99	-0.78	-0.395	-0.295	-0.000	0.029	0.091
NR 2858	10.12	0.00	-1.58	-0.905	-0.315	-0.019	-0.024	0.008
NR 2859	10.12	22.51	-1.60	-0.880	-0.304	0.010	-0.067	0.050
NR 2860	10.11	44.99	-1.63	-0.874	-0.295	0.000	-0.010	0.058
NR 2861	10.09	67.48	-1.59	-0.860	-0.301	-0.020	0.050	0.062
NR 2862	10.07	89.98	-1.58	-0.887	-0.306	0.009	0.014	0.073
NR 2871	15.14	-0.07	-1.81	-0.884	-0.357	0.005	-0.053	-0.106
NR 2872	15.14	-0.07	-1.81	-0.876	-0.357	0.005	-0.053	-0.110
NR 2869	15.15	22.36	-1.73	-0.772	-0.383	0.086	-0.140	-0.198
NR 2870	15.15	22.36	-1.73	-0.765	-0.383	0.086	-0.137	-0.196
NR 2867	15.15	45.02	-2.16	-1.185	-0.281	0.008	-0.042	0.105
NR 2868	15.15	45.02	-2.16	-1.177	-0.286	0.008	-0.036	0.103
NR 2865	15.11	67.63	-1.79	-0.796	-0.465	-0.087	0.107	0.308
NR 2866	15.11	67.63	-1.78	-0.792	-0.365	-0.096	0.116	0.303
NR 2863	15.10	90.05	-1.85	-0.908	-0.346	-0.028	0.058	0.185
NR 2864	15.10	90.05	-1.86	-0.913	-0.346	-0.038	0.068	0.185
NR 2873	20.17	-0.13	-2.13	-0.946	-0.407	0.273	-0.304	-0.209
NR 2874	20.17	-0.13	-2.13	-0.946	-0.407	0.267	-0.306	-0.209
NR 2875	20.17	22.33	-2.20	-1.000	-0.370	0.194	-0.281	-0.236
NR 2876	20.17	22.33	-2.20	-0.995	-0.370	0.179	-0.265	-0.233
NR 2877	20.18	45.01	-2.43	-1.227	-0.259	-0.027	-0.004	0.082
NR 2878	20.18	45.01	-2.43	-1.222	-0.254	-0.027	0.001	0.089
NR 2879	20.15	67.62	-2.14	-0.904	-0.378	-0.126	0.162	0.294
NR 2880	20.15	67.62	-2.13	-0.900	-0.378	-0.121	0.161	0.289
NR 2881	20.13	90.12	-2.14	-0.932	-0.403	-0.326	0.321	0.291
NR 2882	20.13	90.12	-2.14	-0.932	-0.398	-0.326	0.321	0.287

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.F 3FT-4FT TUNNEL RESULTS.

DP.NO.	ATTITUDE				COEFFICIENTS			
	THETA	PHI	CZ	CM	CX	CY	CN	CL
NR 2888	25.19	-0.06	-2.34	-0.873	-0.446	-0.040	-0.028	-0.100
NR 2887	25.19	22.44	-2.41	-0.908	-0.366	-0.313	0.210	-0.058
NR 2886	25.20	45.09	-2.59	-1.121	-0.254	-0.025	-0.015	0.209
NR 2885	25.18	67.57	-2.46	-0.952	-0.349	0.033	0.027	0.205
NR 2883	25.15	90.05	-2.37	-0.899	-0.438	-0.098	0.135	0.182
NR 2884	25.15	90.05	-2.37	-0.899	-0.438	-0.098	0.142	0.182
NR 2889	29.22	-0.06	-2.67	-1.024	-0.433	-0.120	0.005	-0.094
NR 2890	29.22	22.47	-2.66	-0.983	-0.325	-0.346	0.249	-0.021
NR 2891	29.22	44.46	-2.81	-1.162	-0.189	0.123	-0.137	-0.003
NR 2892	29.22	44.46	-2.83	-1.175	-0.194	0.113	-0.138	0.006
NR 2893	29.22	44.47	-2.83	-1.175	-0.194	0.133	-0.152	0.013
NR 2894	29.20	67.53	-2.69	-1.007	-0.319	0.154	-0.081	0.132
NR 2895	29.18	90.05	-2.71	-1.080	-0.423	-0.038	0.125	0.171
NR 2837	0.00	-0.01	-0.01	0.036	-0.284	0.091	-0.031	-0.018
NR 2896	0.00	0.00	-0.03	0.016	-0.284	0.079	-0.042	0.000

(Run.45)

RUN NUMBER=45 SHORT BODY, SQUARE NOSE, CURVED TAIL B
 CANT ANGLE=0.0 CD POSITION 50.00X
 V= 240, FPS RE= 0.384 MILLION

	OP.NO.	ATTITUDE		CZ	CM	COEFFICIENTS		CN	CL
		THETA	PHI			CX	CY		
NR	2900	-10.12	-0.01	1.68	1.144	-0.963	0.184	-0.085	-0.009
NR	2901	-10.13	22.49	1.66	1.046	-0.968	0.137	0.026	0.030
NR	2902	-10.15	44.99	1.66	0.942	-0.969	0.107	0.044	0.073
NR	2903	-10.17	67.50	1.65	0.950	-0.972	0.089	0.039	0.106
NR	2904	-10.19	89.99	1.68	0.990	-0.976	0.030	0.104	0.195
NR	2909	-5.06	0.10	0.84	0.601	-0.936	0.151	-0.113	-0.004
NR	2907	-5.08	45.00	0.86	0.543	-0.939	0.095	0.021	0.076
NR	2906	-5.10	67.50	0.87	0.537	-0.943	0.047	0.085	0.103
NR	2905	-5.12	89.99	0.86	0.500	-0.943	0.010	0.121	0.100
NR	2910	0.00	0.09	-0.02	-0.029	-0.913	0.090	-0.086	-0.011
NR	2911	0.00	22.49	-0.02	-0.041	-0.916	0.071	-0.022	0.036
NR	2912	-0.02	44.99	-0.03	-0.068	-0.914	0.057	0.042	0.074
NR	2913	-0.04	67.49	-0.02	-0.093	-0.918	0.046	0.083	0.102
NR	2914	-0.06	89.99	-0.01	-0.116	-0.918	0.020	0.116	0.199
NR	2919	5.06	0.09	-0.89	-0.657	-0.939	0.016	-0.030	-0.009
NR	2918	5.06	22.49	-0.89	-0.651	-0.943	0.016	0.010	0.028
NR	2917	5.05	44.99	-0.89	-0.650	-0.938	0.041	0.037	0.066
NR	2916	5.03	67.49	-0.89	-0.701	-0.947	0.053	0.070	0.091
NR	2915	5.01	89.99	-0.87	-0.741	-0.938	0.050	0.083	0.099
NR	2920	10.12	0.09	-1.68	-1.115	-0.971	-0.032	0.016	-0.010
NR	2921	10.12	22.49	-1.66	-1.056	-0.972	-0.002	0.004	0.027
NR	2922	10.11	44.99	-1.67	-1.033	-0.962	0.016	0.061	0.068
NR	2923	10.10	67.49	-1.66	-1.104	-0.963	0.028	0.102	0.099
NR	2924	10.08	89.98	-1.67	-1.199	-0.968	0.039	0.082	0.091
NR	2933	15.15	-0.09	-2.02	-1.130	-1.054	0.041	-0.082	-0.151
NR	2934	15.15	-0.08	-2.03	-1.133	-1.054	0.034	-0.084	-0.138
NR	2931	15.16	22.48	-2.15	-1.196	-1.007	-0.140	0.080	0.017
NR	2932	15.16	22.48	-2.15	-1.188	-1.007	-0.145	0.090	0.018
NR	2929	15.17	45.10	-2.39	-1.404	-0.954	0.001	0.044	0.078
NR	2930	15.17	45.10	-2.39	-1.391	-0.954	-0.006	0.057	0.079
NR	2927	15.14	67.52	-2.13	-1.212	-1.008	0.115	0.046	0.137
NR	2928	15.14	67.52	-2.13	-1.214	-1.008	0.113	0.038	0.136
NR	2925	15.11	90.07	-2.05	-1.234	-1.038	-0.037	0.146	0.231
NR	2926	15.11	90.08	-2.05	-1.242	-1.043	-0.027	0.129	0.238
NR	2935	20.19	-0.08	-2.37	-1.015	-1.134	0.007	-0.088	-0.133
NR	2936	20.19	-0.08	-2.38	-1.032	-1.134	-0.012	-0.059	-0.138
NR	2937	20.19	22.41	-2.41	-1.020	-1.088	-0.078	-0.015	-0.102
NR	2938	20.19	22.41	-2.41	-1.013	-1.236	-0.088	-0.006	-0.099
NR	2939	20.21	44.99	-2.83	-1.412	-0.992	0.029	-0.002	0.049
NR	2940	20.21	44.97	-2.84	-1.416	-1.140	0.090	-0.060	0.024
NR	2941	20.21	44.96	-2.63	-1.322	-1.135	-0.131	0.063	0.021
NR	2942	20.17	67.57	-2.44	-1.074	-1.144	0.054	0.079	0.224
NR	2943	20.17	67.57	-2.43	-1.071	-1.140	0.059	0.068	0.217
NR	2944	20.15	90.07	-2.41	-1.126	-1.116	-0.067	0.177	0.234
NR	2945	20.15	90.07	-2.43	-1.138	-1.116	-0.067	0.169	0.228

R=RESULTS IN ROLLING BODY AXES.
 NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E 3FT+4FT TUNNEL RESULTS.

	OP.NO	ATTITUDE		COEFFICIENTS					
		THETA	PHI	CZ	CM	CX	CY	CN	CL
NR	2954	25.22	-0.05	-2.77	-1.039	-1.202	-0.120	0.021	-0.090
NR	2955	25.22	-0.06	-2.77	-1.032	-1.197	-0.113	0.023	-0.096
NR	2952	25.23	22.50	-2.88	-1.085	-1.127	-0.372	0.274	0.045
NR	2953	25.23	22.50	-2.88	-1.083	-1.127	-0.366	0.267	0.038
NR	2950	25.25	45.11	-3.24	-1.447	-0.997	-0.036	0.043	0.088
NR	2951	25.25	45.10	-3.23	-1.441	-1.002	-0.039	0.040	0.083
NR	2948	25.21	67.50	-2.86	-1.096	-1.127	0.243	-0.112	0.100
NR	2949	25.21	67.50	-2.86	-1.102	-1.127	0.245	-0.101	0.098
NR	2946	25.19	90.05	-2.80	-1.149	-1.177	0.002	0.122	0.193
NR	2947	25.19	90.05	-2.81	-1.155	-1.177	0.012	0.104	0.196
NR	2956	29.25	-0.06	-3.13	-1.189	-1.199	-0.100	0.012	-0.096
NR	2957	29.25	-0.06	-3.13	-1.174	-1.194	-0.099	0.003	-0.106
NR	2958	29.25	-0.07	-3.13	-1.189	-1.194	-0.113	0.033	-0.111
NR	2959	29.26	22.57	-3.20	-1.181	-1.116	-0.515	0.386	0.158
NR	2960	29.26	22.57	-3.21	-1.207	-1.121	-0.517	0.382	0.146
NR	2961	29.27	45.00	-3.47	-1.486	-0.981	-0.046	0.049	0.068
NR	2962	29.27	45.00	-3.47	-1.501	-0.976	-0.035	0.038	0.072
NR	2963	29.24	67.44	-3.15	-1.201	-1.121	0.325	-0.207	-0.008
NR	2964	29.24	67.43	-3.16	-1.210	-1.126	0.332	-0.214	-0.013
NR	2965	29.22	90.05	-3.16	-1.301	-1.166	-0.027	0.157	0.185
NR	2966	29.22	90.05	-3.16	-1.308	-1.171	-0.037	0.183	0.181
NR	2967	0.00	0.00	-0.04	-0.010	-0.908	0.074	-0.069	-0.007

(Run.46)

RUN NUMBER=46 LONG BODY, SQUARE NOSE, CURVED TAIL B
CANT ANGLE= 0.0 DEG. CG POSITION 50.00%
V= 240. FPS RE= 0.384 MILLION

	OP.NO.	ATTITUDE		COEFFICIENTS					
		THETA	PHI	CZ	CM	CX	CY	CN	CL
NR	2971	-10.08	90.02	0.12	0.209	-0.950	-1.560	1.863	0.027
NR	2972	-10.09	112.31	0.06	0.016	-0.940	-1.538	1.816	0.039
NR	2973	-10.09	112.31	0.06	0.019	-0.940	-1.541	1.810	0.037
NR	2974	-10.10	135.01	0.08	0.044	-0.940	-1.509	1.714	0.050
NR	2975	-10.10	135.01	0.07	0.034	-0.935	-1.513	1.715	0.041
NR	2976	-10.13	157.30	0.12	0.133	-0.941	-1.545	1.786	0.044
NR	2977	-10.13	157.30	0.12	0.125	-0.941	-1.545	1.789	0.043
NR	2978	-10.15	179.99	0.06	-0.019	-0.931	-1.579	1.847	0.031
NR	2979	-10.15	179.99	0.06	-0.019	-0.931	-1.579	1.847	0.024
NR	2984	-5.04	0.11	0.72	0.885	-0.915	0.069	-0.134	0.010
NR	2983	-5.04	22.30	0.72	0.906	-0.914	0.071	-0.087	0.015
NR	2982	-5.06	45.00	0.73	0.904	-0.909	0.080	-0.046	0.034
NR	2981	-5.08	67.30	0.73	0.896	-0.914	0.055	-0.004	0.044
NR	2980	-5.10	89.99	0.74	0.888	-0.920	0.030	0.051	0.025
NR	2985	0.00	0.10	-0.07	-0.051	-0.894	0.030	-0.056	-0.007
NR	2986	0.00	22.30	-0.07	-0.034	-0.893	0.030	-0.012	0.010
NR	2987	-0.01	45.00	-0.08	-0.061	-0.892	0.018	0.038	0.026
NR	2988	-0.03	67.30	-0.08	-0.089	-0.896	0.019	0.064	0.035
NR	2989	-0.05	89.99	-0.08	-0.125	-0.896	0.020	0.083	0.035
NR	2996	5.04	-0.01	-0.83	-0.985	-0.927	-0.001	-0.001	-0.009
NR	2995	5.04	22.48	-0.85	-0.981	-0.925	-0.003	0.025	-0.012
NR	2994	5.03	44.99	-0.85	-0.962	-0.924	0.001	0.056	0.007
NR	2992	5.01	67.49	-0.86	-1.000	-0.928	0.013	0.074	0.028
NR	2993	5.01	67.49	-0.86	-1.005	-0.928	0.013	0.061	0.027
NR	2990	4.99	89.98	-0.87	-1.048	-0.933	0.030	0.074	0.018
NR	2991	4.99	89.98	-0.86	-1.040	-0.938	0.020	0.059	0.014
NR	2997	10.09	-0.01	-1.65	-1.889	-0.965	-0.048	0.095	-0.020
NR	2998	10.09	-0.01	-1.64	-1.888	-0.965	-0.048	0.103	-0.018
NR	2999	10.09	22.49	-1.65	-1.846	-0.958	0.018	-0.029	-0.001
NR	3000	10.09	22.49	-1.65	-1.843	-0.958	0.019	-0.037	-0.006
NR	3001	10.08	44.98	-1.62	-1.730	-0.952	0.002	0.058	-0.002
NR	3002	10.08	44.98	-1.62	-1.764	-0.957	0.002	0.037	0.000
NR	3003	10.06	67.48	-1.64	-1.846	-0.965	-0.043	0.194	0.007
NR	3004	10.06	67.48	-1.65	-1.846	-0.960	-0.046	0.194	0.010
NR	3005	10.04	89.99	-1.67	-1.947	-0.975	0.020	0.074	0.020
NR	3006	10.04	89.98	-1.67	-1.938	-0.975	0.009	0.090	0.005
NR	3015	15.12	-0.07	-2.21	-2.222	-1.031	-0.046	0.071	-0.110
NR	3016	15.12	-0.07	-2.20	-2.191	-1.036	-0.039	0.054	-0.121
NR	3013	15.12	22.51	-2.24	-2.147	-1.018	-0.095	0.116	0.026
NR	3014	15.13	22.51	-2.25	-2.182	-1.013	-0.092	0.119	0.028
NR	3011	15.13	44.98	-2.40	-2.426	-0.982	-0.026	0.065	-0.002
NR	3012	15.13	44.98	-2.40	-2.426	-0.982	-0.026	0.075	0.001
NR	3009	15.10	67.45	-2.24	-2.178	-1.006	0.021	0.051	-0.037
NR	3010	15.10	67.46	-2.26	-2.188	-1.001	0.017	0.030	-0.032
NR	3007	15.08	90.04	-2.23	-2.202	-1.030	-0.018	0.112	0.104
NR	3008	15.08	90.04	-2.23	-2.203	-1.030	-0.018	0.120	0.106

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E 3FT*4FT TUNNEL RESULTS.

	DP.NO.	ATTITUDE		COEFFICIENTS					
		THETA	PHI	CZ	CM	CX	CY	CN	CL
NR	3017	20.16	-0.10	-2.75	-2.177	-1.093	-0.017	-0.026	-0.156
NR	3018	20.17	-0.10	-2.76	-2.178	-1.088	-0.017	-0.042	-0.157
NR	3019	20.17	22.49	-2.80	-2.149	-1.062	-0.091	0.065	-0.008
NR	1020	20.17	22.49	-2.82	-2.215	-1.061	-0.087	0.125	0.002
NR	3021	20.17	45.02	-3.05	-2.607	-1.029	-0.197	0.413	0.064
NR	3022	20.17	45.02	-3.04	-2.580	-1.024	-0.210	0.406	0.063
NR	3023	20.15	67.47	-2.85	-2.264	-1.055	-0.014	0.015	-0.008
NR	3025	20.15	67.47	-2.86	-2.328	-1.045	-0.029	0.010	-0.009
NR	3026	20.13	90.08	-2.81	-2.203	-1.089	-0.106	0.164	0.167
NR	3027	20.13	90.07	-2.80	-2.211	-1.089	-0.117	0.187	0.161
NR	3038	25.22	-0.11	-3.51	-2.464	-1.119	-0.007	-0.046	-0.182
NR	3039	25.22	-0.11	-3.51	-2.479	-1.124	-0.006	-0.061	-0.172
NR	3035	25.22	22.58	-3.54	-2.334	-1.135	-0.430	0.688	0.148
NR	3036	25.22	22.58	-3.52	-2.344	-1.140	-0.427	0.649	0.143
NR	3037	25.22	22.58	-3.53	-2.363	-1.135	-0.420	0.718	0.151
NR	3032	25.22	45.00	-3.74	-2.778	-1.031	-0.151	0.285	0.032
NR	3033	25.22	45.00	-3.73	-2.784	-1.036	-0.161	0.313	0.035
NR	3034	25.22	45.00	-3.73	-2.778	-1.036	-0.165	0.274	0.030
NR	3030	25.20	67.39	-3.57	-2.515	-1.102	0.162	-0.377	-0.135
NR	3031	25.20	67.38	-3.56	-2.508	-1.112	0.162	-0.439	-0.159
NR	3028	25.19	90.06	-3.54	-2.458	-1.111	-0.126	0.226	0.144
NR	3029	25.19	90.07	-3.55	-2.459	-1.111	-0.126	0.188	0.161
NR	3040	29.25	-0.11	-4.10	-2.812	-1.132	0.013	-0.081	-0.188
NR	3041	29.25	-0.12	-4.10	-2.835	-1.132	0.007	-0.119	-0.194
NR	3042	29.28	22.61	-4.07	-1.155	-1.177	-0.529	1.357	0.191
NR	3043	29.27	22.61	-4.06	-1.182	-1.162	-0.539	1.364	0.200
NR	3044	29.27	44.98	-4.20	-1.857	-1.015	-0.104	1.182	-0.007
NR	3045	29.24	44.99	-3.77	-1.844	-1.014	0.343	1.174	0.014
NR	3046	29.25	67.31	-4.04	-2.114	-1.160	0.284	0.704	-0.271
NR	3047	29.25	67.33	-4.04	-2.132	-1.155	0.262	0.704	-0.245
NR	3048	29.23	90.05	-4.10	-2.809	-1.133	-0.096	1.787	0.122
NR	3049	29.23	90.05	-4.10	-2.785	-1.133	-0.126	1.781	0.126
NR	2970	0.00	-0.01	-0.07	-0.058	-0.899	0.033	-0.064	-0.009
NR	3050	0.02	0.00	-0.05	1.487	-0.903	0.033	-0.066	-0.003

(Run.47)

RUN NUMBER=47 LONG BODY, ROUND NOSE, CURVED TAIL B
CANT ANGLE= 0.0 DEG. CG POSITION 50.00%
V= 240, FPS RE= 0.384 MILLION

OP.NO.	ATTITUDE		COEFFICIENTS					
	THETA	PHI	CZ	CM	CX	CY	CN	CL
NR 3055	-10.08	0.03	1.49	1.631	-0.269	0.098	-0.194	0.043
NR 3056	-10.09	22.53	1.53	1.689	-0.259	0.033	-0.027	0.065
NR 3057	-10.11	45.04	1.56	1.695	-0.255	0.006	0.017	0.090
NR 3058	-10.13	67.53	1.56	1.683	-0.260	-0.004	0.029	0.087
NR 3059	-10.15	90.12	1.53	1.631	-0.275	-0.083	0.151	0.079
NR 3064	-5.04	0.01	0.71	0.736	-0.255	0.058	-0.087	0.010
NR 3063	-5.04	22.51	0.73	0.760	-0.256	0.023	-0.012	0.027
NR 3062	-5.06	45.00	0.74	0.736	-0.252	0.021	0.019	0.038
NR 3061	-5.08	67.50	0.75	0.739	-0.258	-0.003	0.022	0.044
NR 3060	-5.10	90.10	0.74	0.730	-0.263	-0.041	0.087	0.040
NR 3065	0.00	0.00	-0.06	-0.040	-0.255	0.020	-0.033	-0.006
NR 3066	0.00	22.49	-0.05	-0.043	-0.261	0.009	-0.013	-0.004
NR 3067	-0.01	44.98	-0.04	-0.054	-0.258	-0.002	0.013	0.000
NR 3068	-0.03	67.48	-0.05	-0.066	-0.259	-0.020	0.037	0.000
NR 3069	-0.05	89.97	-0.05	-0.082	-0.269	-0.030	0.049	-0.003
NR 3074	5.05	-0.01	-0.82	-0.837	-0.265	0.008	-0.013	-0.019
NR 3073	5.04	22.47	-0.82	-0.832	-0.267	0.027	-0.043	-0.027
NR 3072	5.03	44.96	-0.81	-0.801	-0.263	0.009	-0.000	-0.038
NR 3071	5.01	67.45	-0.81	-0.832	-0.274	-0.023	0.055	-0.045
NR 3070	5.00	89.94	-0.83	-0.860	-0.275	-0.011	0.023	-0.050
NR 3075	10.09	-0.01	-1.57	-1.672	-0.291	-0.045	0.088	-0.023
NR 3076	10.08	22.46	-1.60	-1.713	-0.283	0.008	-0.026	-0.051
NR 3077	10.08	44.93	-1.62	-1.745	-0.275	0.005	0.005	-0.083
NR 3078	10.06	67.41	-1.59	-1.713	-0.291	-0.021	0.045	-0.100
NR 3089	15.11	-0.06	-2.01	-1.943	-0.323	-0.074	0.111	-0.091
NR 3090	15.11	-0.05	-2.01	-1.959	-0.323	-0.075	0.118	-0.088
NR 3087	15.11	22.42	-2.00	-1.913	-0.315	-0.119	0.170	-0.108
NR 3088	15.11	22.43	-2.00	-1.903	-0.315	-0.118	0.166	-0.106
NR 3085	15.11	44.89	-2.21	-2.336	-0.283	-0.019	0.007	-0.150
NR 3086	15.11	44.89	-2.21	-2.331	-0.283	-0.019	0.002	-0.152
NR 3083	15.09	67.44	-2.03	-1.955	-0.313	0.109	-0.182	-0.067
NR 3084	15.09	67.43	-2.03	-1.943	-0.313	0.109	-0.178	-0.074
NR 3081	15.07	89.96	-1.99	-1.898	-0.343	0.019	-0.028	-0.018
NR 3082	15.07	89.96	-2.00	-1.907	-0.343	0.009	-0.036	-0.025
NR 3091	20.14	-0.08	-2.39	-2.010	-0.357	-0.066	0.118	-0.138
NR 3092	20.14	-0.08	-2.39	-2.034	-0.357	-0.060	0.126	-0.138
NR 3093	20.14	22.30	-2.43	-2.187	-0.386	0.354	-0.775	-0.313
NR 3094	20.14	44.95	-2.57	-2.393	-0.287	-0.136	0.275	-0.056
NR 3095	20.14	44.94	-2.57	-2.393	-0.287	-0.136	0.275	-0.062
NR 3096	20.12	67.58	-2.43	-2.090	-0.376	-0.268	0.635	0.171
NR 3097	20.12	67.58	-2.43	-2.091	-0.376	-0.279	0.635	0.171
NR 3098	20.10	90.05	-2.30	-1.829	-0.420	-0.218	0.457	0.126
NR 3099	20.10	90.05	-2.30	-1.829	-0.424	-0.218	0.472	0.130
NR 3108	25.17	-0.11	-2.67	-1.885	-0.433	-0.045	0.049	-0.177
NR 3109	25.17	-0.11	-2.67	-1.901	-0.434	-0.040	0.072	-0.175

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E 3FT*4FT TUNNEL RESULTS.

OP.NO.	ATTITUDE		COEFFICIENTS					
	THETA	PHI	CZ	CM	CX	CY	CN	CL
NR 3106	25.16	22.41	-2.63	-1.883	-0.396	-0.246	0.424	-0.127
NR 3107	25.16	22.41	-2.64	-1.883	-0.401	-0.252	0.424	-0.127
NR 3104	25.17	44.98	-2.94	-2.509	-0.260	-0.031	0.059	-0.169
NR 3105	25.17	44.98	-2.94	-2.531	-0.260	-0.035	0.071	-0.162
NR 3102	25.15	67.47	-2.71	-1.983	-0.372	0.243	-0.486	-0.011
NR 3103	25.15	67.47	-2.71	-1.987	-0.372	0.272	-0.477	-0.008
NR 3100	25.14	90.01	-2.74	-1.949	-0.426	-0.010	0.068	0.053
NR 3101	25.14	90.01	-2.74	-1.933	-0.426	-0.020	0.061	0.054
NR 3110	29.20	-0.11	-3.16	-2.220	-0.437	-0.107	0.166	-0.177
NR 3111	29.20	-0.11	-3.16	-2.220	-0.438	-0.107	0.174	-0.176
NR 3112	29.19	22.43	-2.97	-2.014	-0.430	-0.484	0.886	-0.098
NR 3113	29.20	44.82	-3.36	-2.842	-0.225	-0.006	-0.013	-0.263
NR 3114	29.20	44.83	-3.36	-2.848	-0.220	-0.009	-0.030	-0.254
NR 3115	29.17	67.43	-2.99	-2.056	-0.394	0.491	-0.942	-0.079
NR 3116	29.16	89.98	-2.98	-2.035	-0.430	0.229	-0.391	0.009
NR 3054	0.00	0.00	-0.06	-0.048	-0.255	0.014	-0.033	-0.004
NR 3117	0.00	0.00	-0.06	-0.040	-0.260	0.026	-0.034	-0.004

(Run.48)								
RUN NUMBER=48 LONG BODY, ROUND NOSE, CURVED TAIL C								
CANT ANGLE= 0.0 DEG. CG POSITION 50.00X								
V= 240, FPS RE= 0.384 MILLION								
OP.NO.	ATTITUDE		COEFFICIENTS					
	THETA	PHI	CZ	CM	CX	CY	CN	CL
NR 3121	-10.08	0.00	1.55	1.723	-0.284	-0.024	0.014	0.005
NR 3122	-10.08	22.50	1.49	1.636	-0.274	-0.080	0.172	0.011
NR 3123	-10.10	45.00	1.45	1.549	-0.235	0.011	0.051	0.038
NR 3124	-10.12	67.51	1.45	1.525	-0.240	0.124	-0.155	0.064
NR 3125	-10.14	90.01	1.48	1.567	-0.275	0.120	-0.106	0.059
NR 3130	-5.04	0.10	0.76	0.806	-0.265	0.010	-0.020	0.000
NR 3129	-5.04	22.50	0.68	0.733	-0.255	-0.046	0.036	0.014
NR 3128	-5.06	45.00	0.69	0.671	-0.254	0.011	0.039	0.030
NR 3127	-5.08	67.50	0.68	0.653	-0.249	0.031	0.017	0.039
NR 3126	-5.10	89.99	0.69	0.667	-0.255	0.030	0.020	0.035
NR 3131	0.00	0.10	-0.01	0.021	-0.260	0.055	-0.051	-0.004
NR 3132	0.00	22.50	-0.02	-0.003	-0.259	0.001	0.014	0.009
NR 3133	-0.01	45.00	-0.03	-0.014	-0.254	-0.006	0.055	0.023
NR 3134	-0.03	67.50	-0.05	-0.056	-0.253	-0.023	0.091	0.033
NR 3135	-0.05	89.99	-0.07	-0.095	-0.258	-0.030	0.095	0.035
NR 3140	5.04	-0.01	-0.79	-0.814	-0.260	0.038	-0.029	-0.023
NR 3139	5.04	22.49	-0.76	-0.752	-0.259	0.020	-0.011	-0.004
NR 3138	5.03	45.09	-0.77	-0.726	-0.253	-0.031	0.088	0.019
NR 3137	5.01	67.50	-0.80	-0.792	-0.267	-0.073	0.180	0.033
NR 3136	5.00	90.00	-0.86	-0.905	-0.267	-0.080	0.172	0.040
NR 3141	10.08	-0.02	-1.53	-1.648	-0.281	0.069	-0.081	-0.037
NR 3142	10.08	22.47	-1.50	-1.577	-0.269	0.081	-0.138	-0.029
NR 3144	10.07	44.99	-1.50	-1.513	-0.233	-0.041	0.104	0.008
NR 3146	10.06	67.50	-1.53	-1.612	-0.271	-0.170	0.357	0.045
NR 3148	10.04	90.00	-1.60	-1.735	-0.291	-0.150	0.295	0.048
NR 3191	15.11	0.02	-1.98	-1.850	-0.313	0.058	-0.063	0.034
NR 3192	15.11	0.02	-1.98	-1.858	-0.313	0.052	-0.062	0.034
NR 3193	15.12	22.50	-2.11	-2.139	-0.271	0.069	-0.136	0.021
NR 3194	15.12	22.50	-2.11	-2.139	-0.271	0.069	-0.136	0.020
NR 3195	15.12	44.98	-2.28	-2.428	-0.205	-0.035	0.105	-0.004
NR 3196	15.10	67.47	-2.16	-2.256	-0.272	-0.215	0.459	-0.006
NR 3197	15.10	67.47	-2.16	-2.256	-0.268	-0.215	0.459	-0.006
NR 3198	15.08	89.95	-2.03	-1.968	-0.318	-0.172	0.282	-0.044
NR 3199	15.08	89.95	-2.04	-1.991	-0.318	-0.182	0.306	-0.031
NR 3207	20.14	0.10	-2.33	-1.781	-0.399	-0.243	0.483	0.170
NR 3208	20.14	0.10	-2.32	-1.765	-0.404	-0.237	0.498	0.171
NR 3205	20.14	22.57	-2.48	-2.166	-0.285	-0.135	0.252	0.125
NR 3206	20.14	22.57	-2.48	-2.156	-0.285	-0.135	0.247	0.123
NR 3204	20.16	44.97	-3.00	-3.256	-0.149	-0.072	0.178	-0.012
NR 3202	20.13	67.41	-2.53	-2.311	-0.279	-0.047	0.077	-0.114
NR 3203	20.13	67.41	-2.53	-2.300	-0.284	-0.045	0.080	-0.111
NR 3200	20.10	89.86	-2.37	-1.941	-0.408	0.094	-0.289	-0.195
NR 3201	20.10	89.86	-2.37	-1.965	-0.403	0.084	-0.273	-0.190
NR 3209	25.17	0.05	-2.75	-1.893	-0.408	-0.051	0.173	0.085
NR 3210	25.17	0.05	-2.74	-1.885	-0.408	-0.050	0.157	0.085

R=RESULTS IN ROLLING BODY AXES.
NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E 3FT*4FT TUNNEL RESULTS.

OP.NO.	ATTITUDE		COEFFICIENTS					
	THETA	PHI	CZ	CM	CX	CY	CN	CL
NR 3211	25.17	22.57	-2.84	-2.248	-0.308	-0.140	0.292	0.138
NR 3212	25.17	22.58	-2.84	-2.246	-0.308	-0.156	0.328	0.142
NR 3213	25.20	45.15	-3.50	-3.566	-0.159	-0.487	0.984	0.274
NR 3214	25.20	45.16	-3.50	-3.567	-0.159	-0.487	1.017	0.282
NR 3215	25.16	67.37	-3.03	-2.671	-0.282	0.058	-0.175	-0.179
NR 3216	25.16	67.36	-3.03	-2.659	-0.287	0.058	-0.205	-0.185
NR 3217	25.14	89.91	-2.76	-1.954	-0.431	-0.164	0.177	-0.105
NR 3218	25.14	89.91	-2.76	-1.946	-0.431	-0.164	0.192	-0.102
NR 3227	29.20	0.02	-3.20	-2.163	-0.418	0.157	-0.239	0.027
NR 3225	29.20	22.61	-3.21	-2.486	-0.325	-0.411	0.780	0.193
NR 3226	29.20	22.61	-3.21	-2.483	-0.330	-0.405	0.773	0.193
NR 3222	29.21	44.86	-3.59	-3.392	-0.177	-0.107	0.126	-0.201
NR 3223	29.21	44.86	-3.60	-3.397	-0.177	-0.100	0.121	-0.196
NR 3224	29.21	44.87	-3.61	-3.426	-0.167	-0.114	0.171	-0.178
NR 3220	29.19	67.34	-3.34	-2.814	-0.306	0.178	-0.446	-0.234
NR 3221	29.19	67.34	-3.35	-2.807	-0.301	0.142	-0.407	-0.230
NR 3219	29.16	89.93	-3.04	-2.042	-0.416	-0.384	0.566	-0.073
NR 3120	0.00	0.00	-0.01	0.006	-0.255	0.026	-0.033	-0.004
NR 3150	0.00	0.00	-0.02	0.006	-0.255	0.025	-0.025	-0.002
NR 3190	0.00	0.00	-0.03	0.005	-0.255	0.026	-0.033	-0.006
NR 3228	0.00	0.00	-0.02	0.006	-0.260	0.026	-0.033	-0.004

(Run.49)

RUN NUMBER=49 LONG BODY, SQUARE NOSE, CURVED TAIL C
 CANT ANGLE= 0.0 DEG. CG POSITION 50.00X
 V= 240. FPS RE= 0.384 MILLION

OP.NO.	ATTITUDE			COEFFICIENTS				
	THETA	PHI	CZ	CM	CX	CY	CN	CL
NR 3232	-10.08	0.00	1.61	1.946	-0.960	0.009	-0.031	0.007
NR 3233	-10.09	22.50	1.54	1.818	-0.944	-0.053	0.178	0.013
NR 3234	-10.10	45.01	1.47	1.657	-0.920	0.039	0.027	0.041
NR 3235	-10.10	45.01	1.46	1.657	-0.920	0.035	0.027	0.041
NR 3236	-10.12	67.52	1.50	1.713	-0.931	0.164	-0.179	0.068
NR 3237	-10.12	67.52	1.50	1.710	-0.931	0.164	-0.185	0.068
NR 3238	-10.15	90.01	1.55	1.804	-0.946	0.120	-0.060	0.059
NR 3239	-10.15	90.01	1.55	1.804	-0.946	0.120	-0.076	0.057
NR 3244	-5.04	0.10	0.76	0.951	-0.920	0.010	-0.021	-0.003
NR 3243	-5.04	22.49	0.72	0.890	-0.919	0.009	0.021	0.003
NR 3242	-5.06	45.00	0.68	0.836	-0.919	0.029	0.037	0.033
NR 3241	-5.08	67.51	0.68	0.823	-0.919	0.056	0.036	0.050
NR 3240	-5.10	90.00	0.70	0.838	-0.919	0.060	0.027	0.045
NR 3245	0.00	0.10	-0.05	-0.018	-0.894	0.024	-0.041	-0.006
NR 3246	0.00	22.50	-0.04	-0.013	-0.893	0.002	0.023	0.012
NR 3247	-0.01	45.00	-0.06	-0.043	-0.892	-0.004	0.077	0.027
NR 3248	-0.03	67.50	-0.07	-0.092	-0.896	-0.007	0.118	0.037
NR 3249	-0.05	90.00	-0.08	-0.148	-0.901	-0.020	0.139	0.036
NR 3257	5.04	-0.02	-0.80	-0.946	-0.922	0.057	-0.036	-0.025
NR 3253	5.04	-0.02	-0.80	-0.946	-0.927	0.050	-0.036	-0.025
NR 3256	5.04	22.48	-0.78	-0.894	-0.920	0.025	0.039	-0.010
NR 3254	5.03	44.99	-0.76	-0.865	-0.924	-0.013	0.125	0.021
NR 3255	5.03	44.99	-0.77	-0.859	-0.924	-0.017	0.131	0.021
NR 3252	5.01	67.50	-0.80	-0.956	-0.923	-0.040	0.210	0.047
NR 3253	5.01	67.50	-0.81	-0.950	-0.928	-0.045	0.207	0.048
NR 3250	4.99	90.00	-0.86	-1.085	-0.937	-0.060	0.218	0.047
NR 3251	4.99	90.00	-0.86	-1.077	-0.932	-0.070	0.218	0.045
NR 3259	10.09	-0.02	-1.62	-1.860	-0.966	0.060	-0.021	-0.038
NR 3260	10.09	-0.02	-1.62	-1.852	-0.966	0.055	-0.037	-0.036
NR 3261	10.08	22.47	-1.57	-1.753	-0.954	0.105	-0.135	-0.032
NR 3262	10.08	22.47	-1.57	-1.754	-0.949	0.099	-0.134	-0.025
NR 3263	10.07	44.99	-1.54	-1.649	-0.932	-0.023	0.145	0.007
NR 3264	10.07	44.99	-1.54	-1.655	-0.932	-0.027	0.140	0.009
NR 3265	10.06	67.51	-1.59	-1.794	-0.960	-0.149	0.412	0.051
NR 3266	10.06	67.51	-1.59	-1.784	-0.955	-0.149	0.415	0.049
NR 3267	10.04	90.00	-1.67	-1.983	-0.974	-0.110	0.288	0.048
NR 3268	10.04	90.00	-1.67	-1.975	-0.974	-0.110	0.296	0.047
NR 3277	15.12	0.13	-2.20	-2.130	-1.020	0.024	0.019	0.046
NR 3278	15.12	0.13	-2.19	-2.130	-1.020	0.024	0.019	0.045
NR 3275	15.13	22.56	-2.31	-2.330	-0.989	0.059	-0.093	0.108
NR 3276	15.13	22.56	-2.31	-2.351	-0.989	0.065	-0.102	0.110
NR 3273	15.12	44.99	-2.33	-2.379	-0.927	-0.058	0.152	0.010
NR 3274	15.12	44.99	-2.33	-2.384	-0.932	-0.058	0.136	0.006
NR 3271	15.11	67.42	-2.32	-2.417	-0.990	-0.218	0.462	-0.087
NR 3272	15.11	67.43	-2.34	-2.428	-0.990	-0.214	0.476	-0.076
NR 3269	15.08	89.94	-2.22	-2.233	-1.030	-0.132	0.214	-0.050
NR 3270	15.08	89.94	-2.23	-2.257	-1.030	-0.132	0.222	-0.050

R=RESULTS IN ROLLING BODY AXES.

NR=RESULTS IN NON-ROLLING BODY AXES.

WIND TUNNEL TESTS ON CANTED FIN BOMBLETS - R.A.E 3FT*4FT TUNNEL RESULTS.

OP.NO.	ATTITUDE			COEFFICIENTS				
	THETA	PHI	CZ	CM	CX	CY	CN	CL
NR 3279	20.17	0.16	-2.78	-2.137	-1.072	-0.077	0.127	0.106
NR 3280	20.17	0.17	-2.77	-2.137	-1.072	-0.077	0.119	0.111
NR 3281	20.18	22.66	-2.99	-2.497	-1.050	-0.133	0.513	0.272
NR 3282	20.18	22.66	-2.99	-2.481	-1.050	-0.148	0.294	0.282
NR 3283	20.18	44.99	-3.19	-2.984	-0.935	-0.083	0.194	0.014
NR 3284	20.18	44.98	-3.19	-3.005	-0.925	-0.090	0.174	0.002
NR 3285	20.16	67.31	-2.98	-2.609	-1.039	-0.052	0.022	-0.275
NR 3286	20.16	67.31	-2.98	-2.627	-1.039	-0.055	0.005	-0.273
NR 3287	20.13	89.91	-2.82	-2.261	-1.084	-0.114	0.095	-0.100
NR 3288	20.13	89.91	-2.82	-2.261	-1.089	-0.114	0.087	-0.104
NR 3297	25.22	0.04	-3.50	-2.392	-1.103	-0.090	0.063	0.071
NR 3298	25.22	0.05	-3.50	-2.405	-1.103	-0.079	0.118	0.081
NR 3295	25.23	22.70	-3.79	-2.782	-1.056	-0.294	0.502	0.346
NR 3296	25.23	22.70	-3.79	-2.819	-1.061	-0.273	0.487	0.340
NR 3293	25.23	45.08	-3.90	-3.161	-0.936	-0.288	0.624	0.157
NR 3294	25.23	45.07	-3.89	-3.161	-0.936	-0.310	0.559	0.145
NR 3291	25.21	67.25	-3.78	-3.026	-1.056	-0.002	-0.192	-0.379
NR 3292	25.21	67.25	-3.78	-2.967	-1.057	0.008	-0.117	-0.378
NR 3289	25.19	89.92	-3.56	-2.507	-1.121	-0.175	0.197	-0.094
NR 3290	25.19	89.92	-3.56	-2.516	-1.106	-0.175	0.152	-0.096
NR 3299	28.24	0.04	-3.94	-2.701	-1.119	-0.064	0.106	0.068
NR 3300	28.25	0.04	-3.95	-2.663	-1.109	-0.071	0.122	0.072
NR 3301	28.26	22.73	-4.22	-3.061	-1.056	-0.327	0.536	0.383
NR 3302	28.26	22.72	-4.23	-3.129	-1.056	-0.324	0.518	0.375
NR 3303	28.26	45.05	-4.30	-3.320	-0.962	-0.331	0.654	0.109
NR 3304	28.26	45.05	-4.29	-3.347	-0.967	-0.327	0.596	0.106
NR 3305	28.24	67.22	-4.21	-3.254	-1.057	-0.010	-0.212	-0.415
NR 3306	28.24	67.23	-4.23	-3.306	-1.057	-0.018	-0.189	-0.411
NR 3307	28.22	90.02	-4.02	-2.790	-1.126	-0.139	0.168	-0.092
NR 3308	28.22	90.02	-4.03	-2.831	-1.126	-0.159	0.147	-0.085
NR 3231	0.00	0.00	-0.03	-0.010	-0.899	0.026	-0.049	-0.003
NR 3309	0.00	0.10	-0.03	0.006	-0.899	0.010	-0.016	0.000

R=RESULTS IN ROLLING BODY AXES.

NR=RESULTS IN NON-ROLLING BODY AXES.

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SYMBOLS

b	fin span	
d	body diameter	
C_ℓ	rolling moment coefficient	} non-dimensionalized with respect to qSd
C_m	pitching moment coefficient	
C_n	yawing moment coefficient	
C_D	drag coefficient (see section 3)	} non-dimensionalized with respect to qS
C_L	lift coefficient (see section 3)	
C_N	fin normal force coefficient	
C_X	axial force coefficient	
C_Y	side force coefficient	
C_Z	normal force coefficient	
\bar{C}_m	$C_m \cos \phi - C_n \sin \phi$	
\bar{C}_n	$C_m \sin \phi + C_n \cos \phi$	
\bar{C}_Y	$-C_Z \sin \phi + C_Y \cos \phi$	
\bar{C}_Z	$C_Z \cos \phi + C_Y \sin \phi$	
ℓ	body length	
p	static pressure on the base of a bomblet	
q	dynamic pressure of free stream	
S	$\pi d^2/4$	
U	free stream velocity	
X	distance measured rearwards from nose	
α	fin incidence	
δ	fin cant	
θ	pitch angle	
ϕ	roll angle	

List of subscripts

b	due to body alone
f	due to fin
δ	due to fin cant

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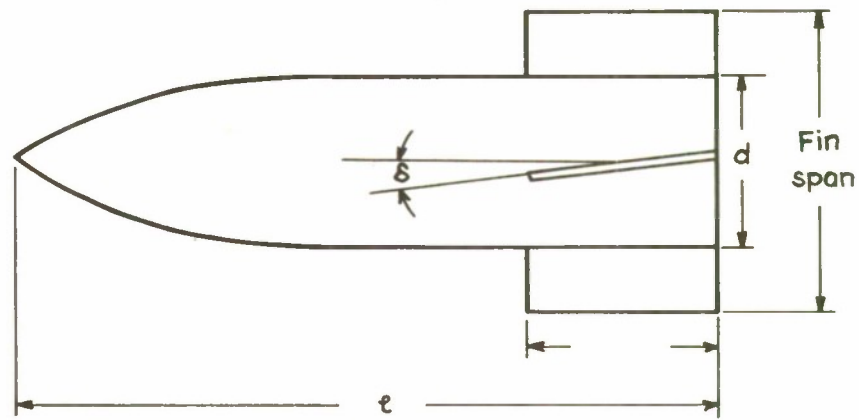


Fig.1a Bomblet with canted fins

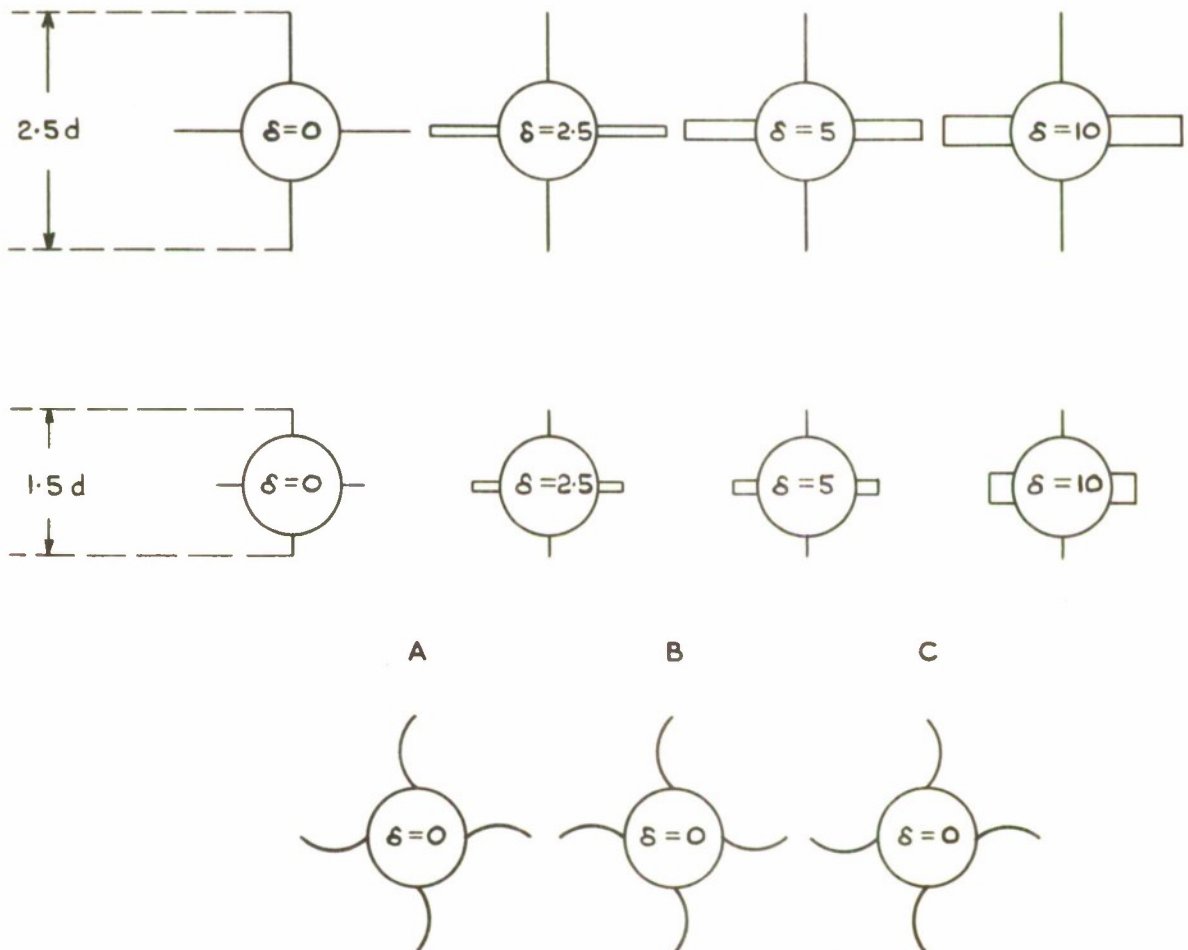


Fig.1b Fin configurations (viewed from the nose)

Fig.2

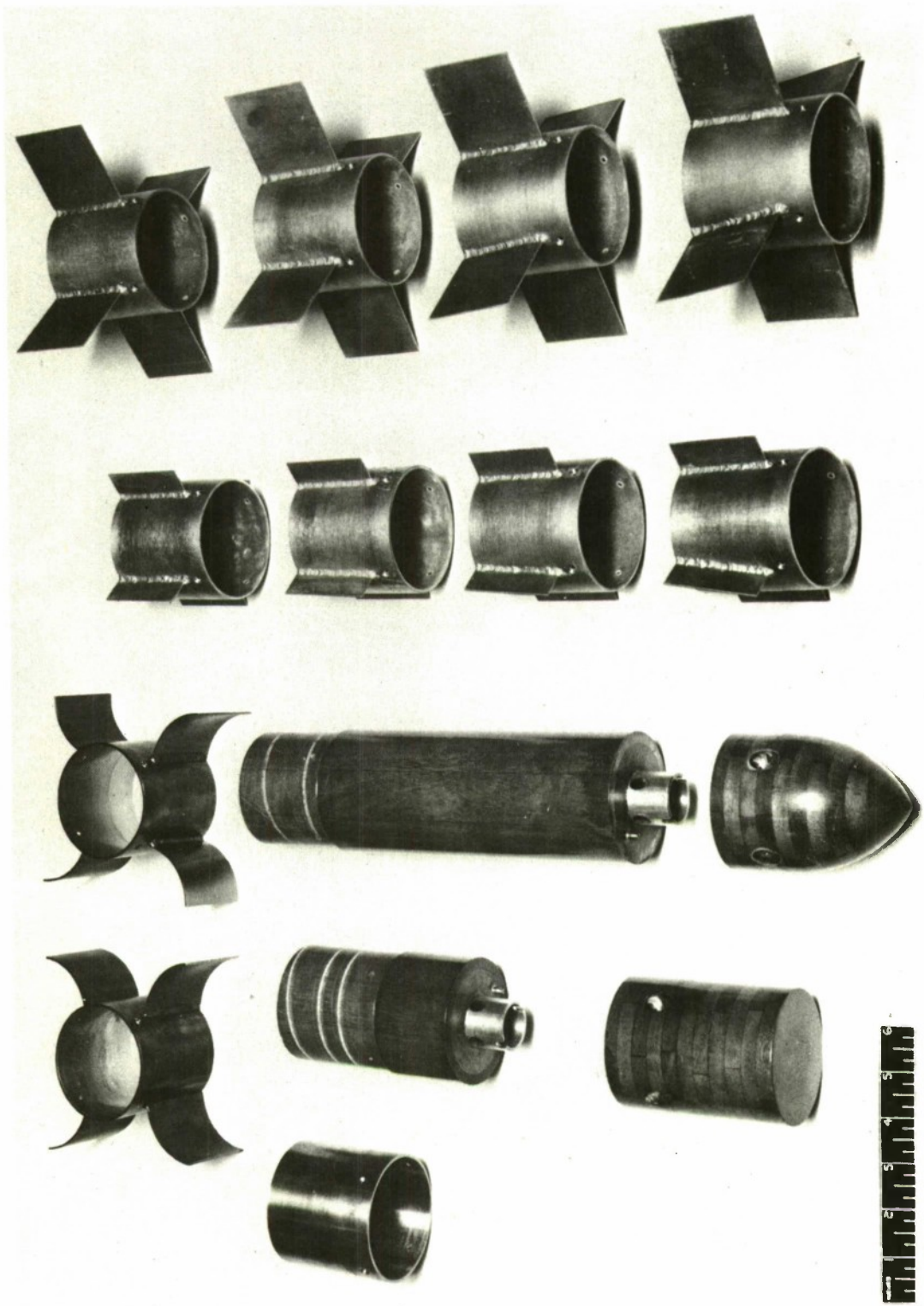


Fig.2. Bomblet components

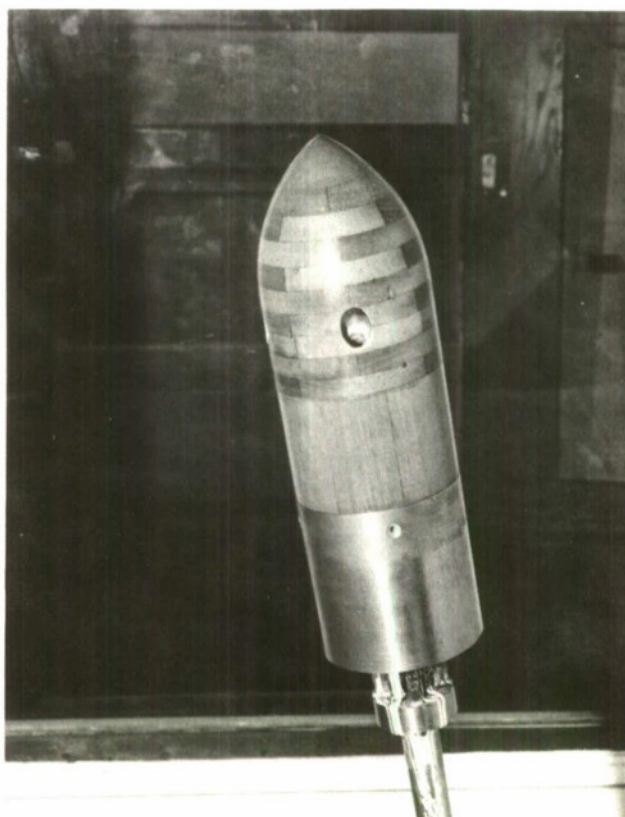
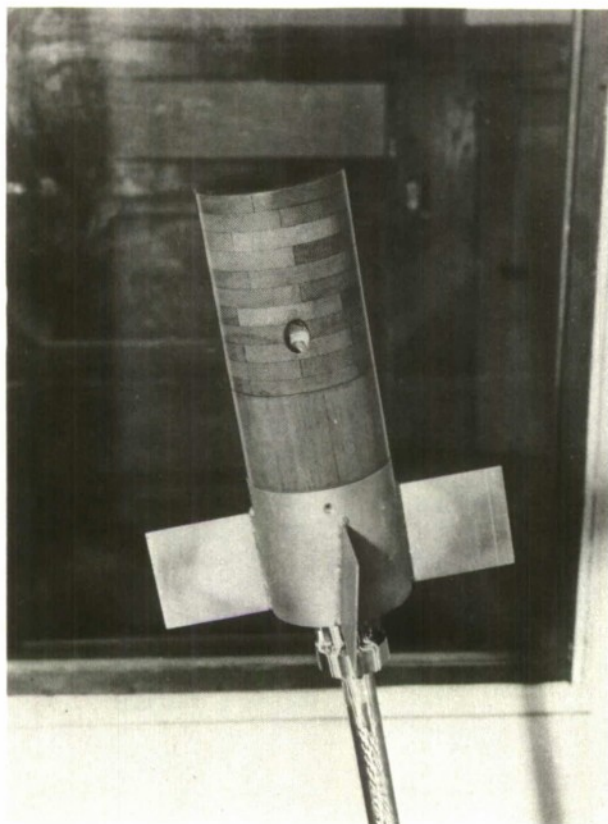


Fig.3. Bomblets mounted in the wind-tunnel. (Tail-retaining screws not fitted)

Fig.4

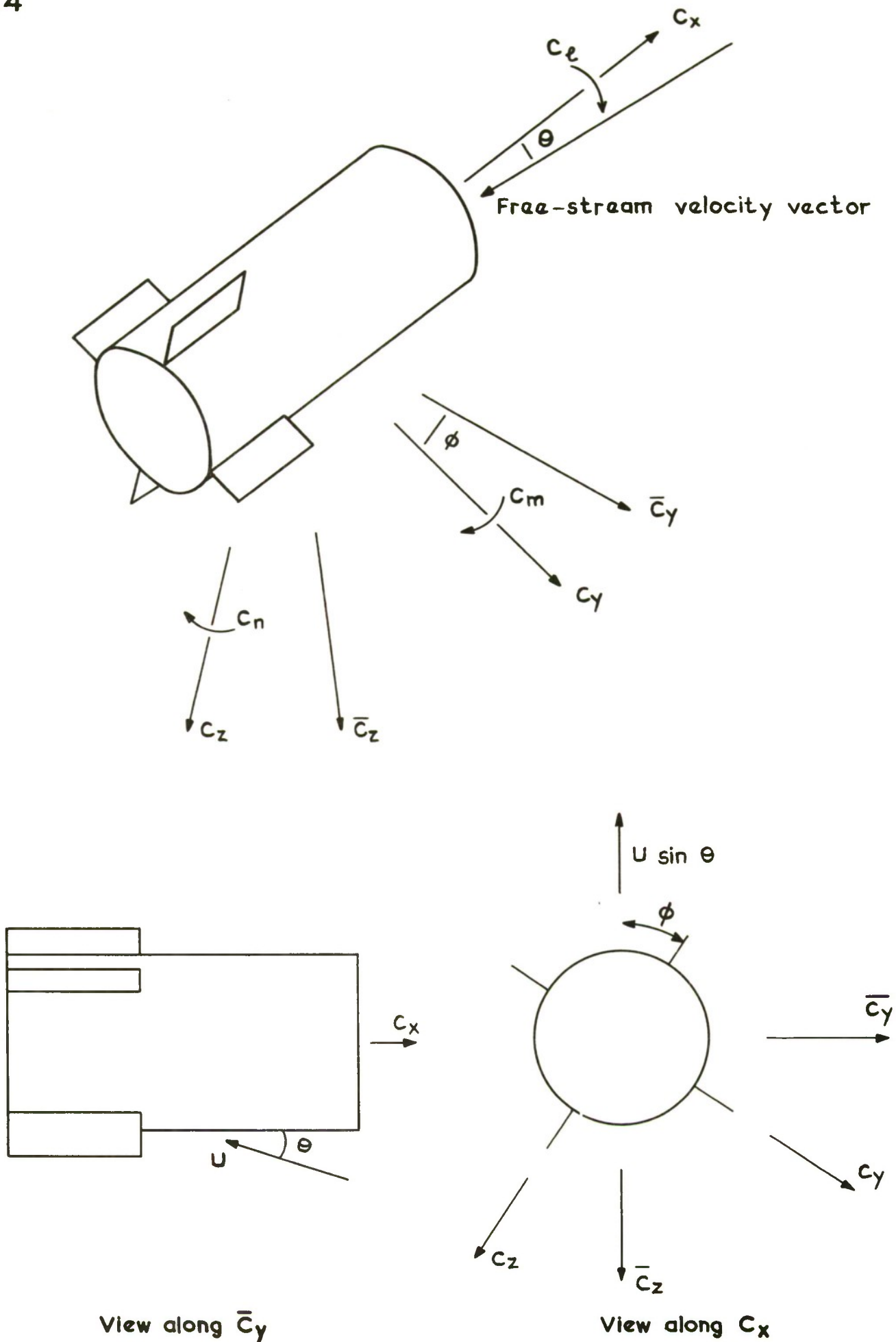


Fig.4 Axis system (not to scale)

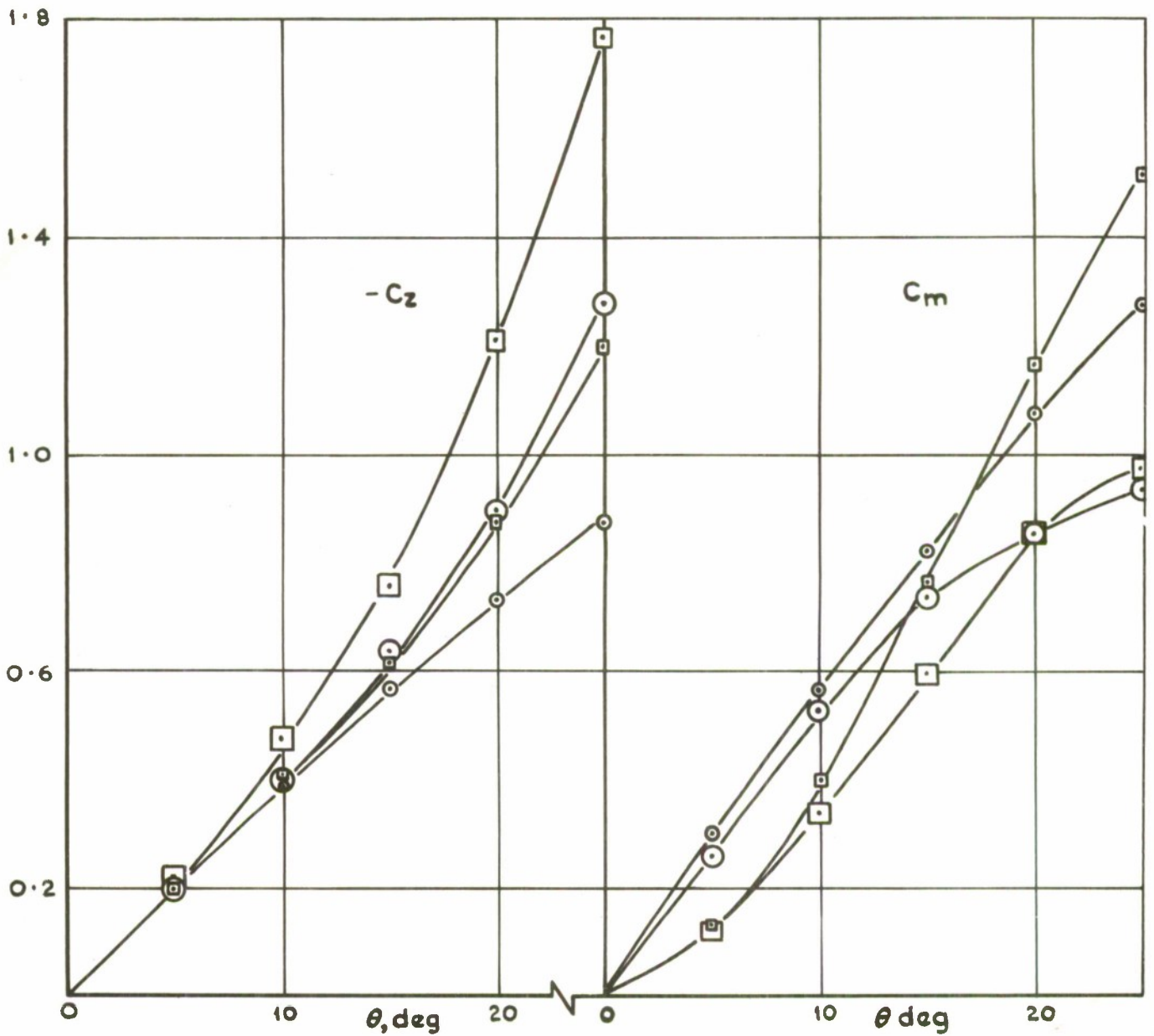


Fig. 5 Normal force and pitching moment characteristics of bomblets without fins

Fig.6

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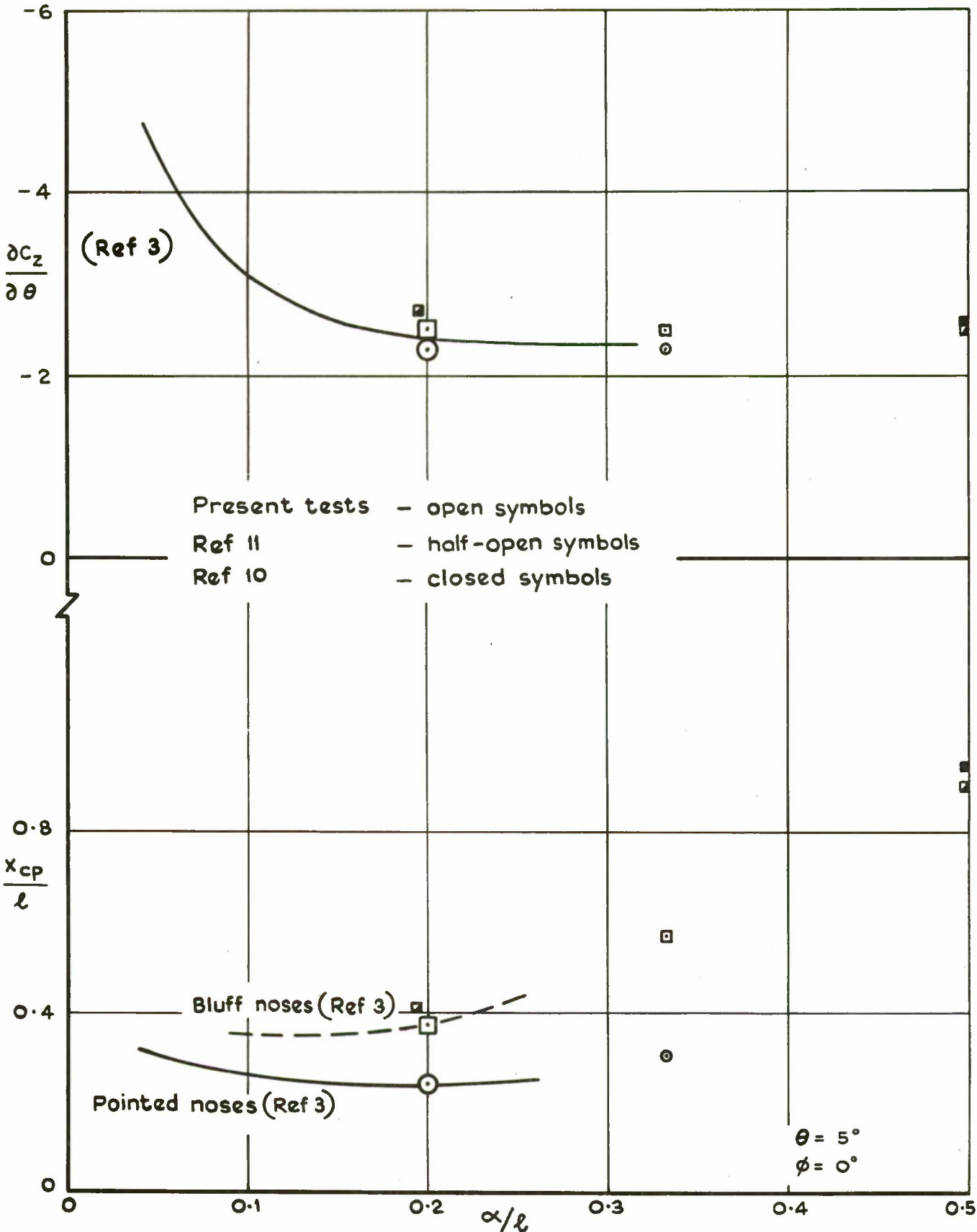


Fig.6 Characteristics of bomblets without fins

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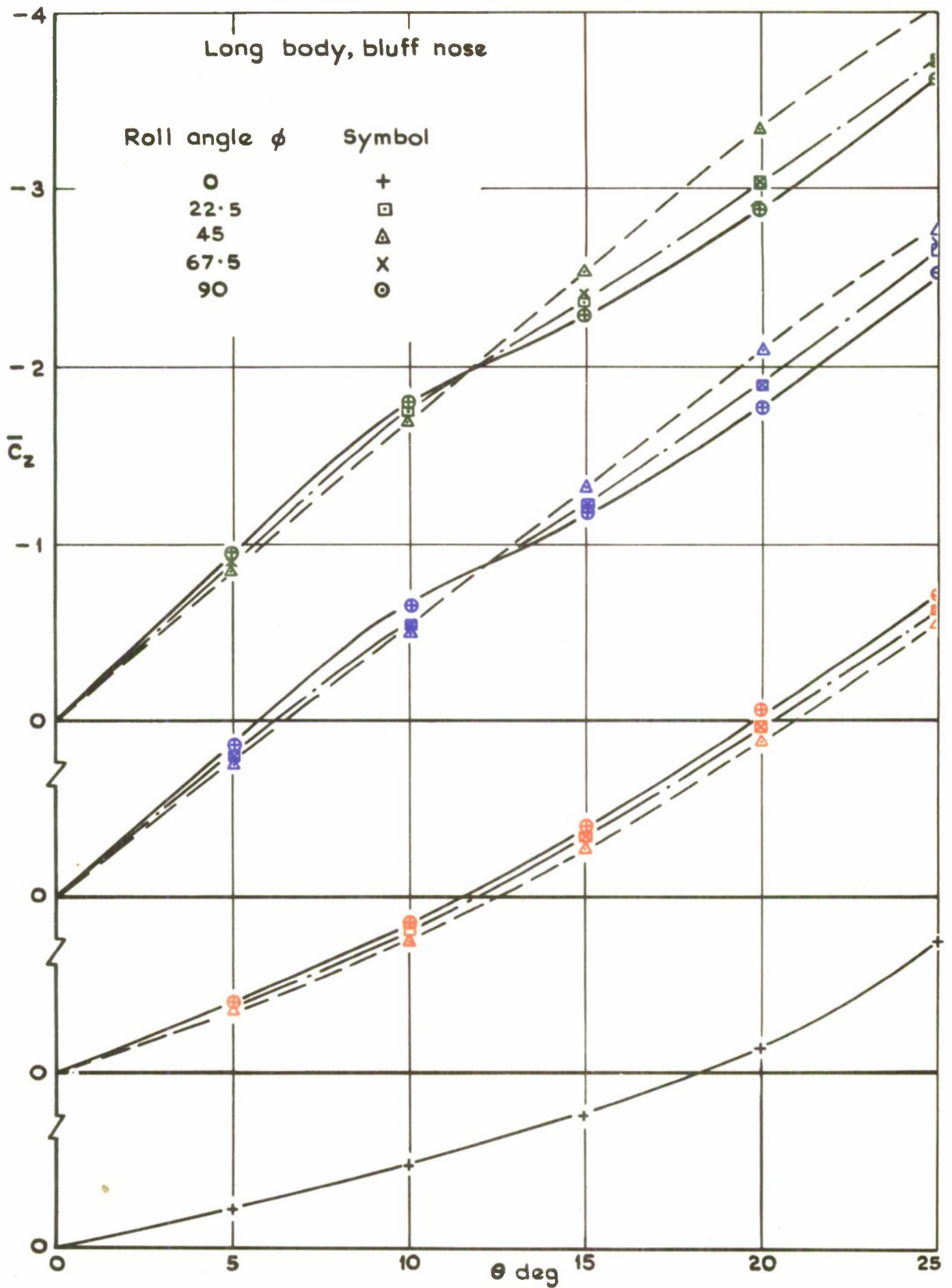
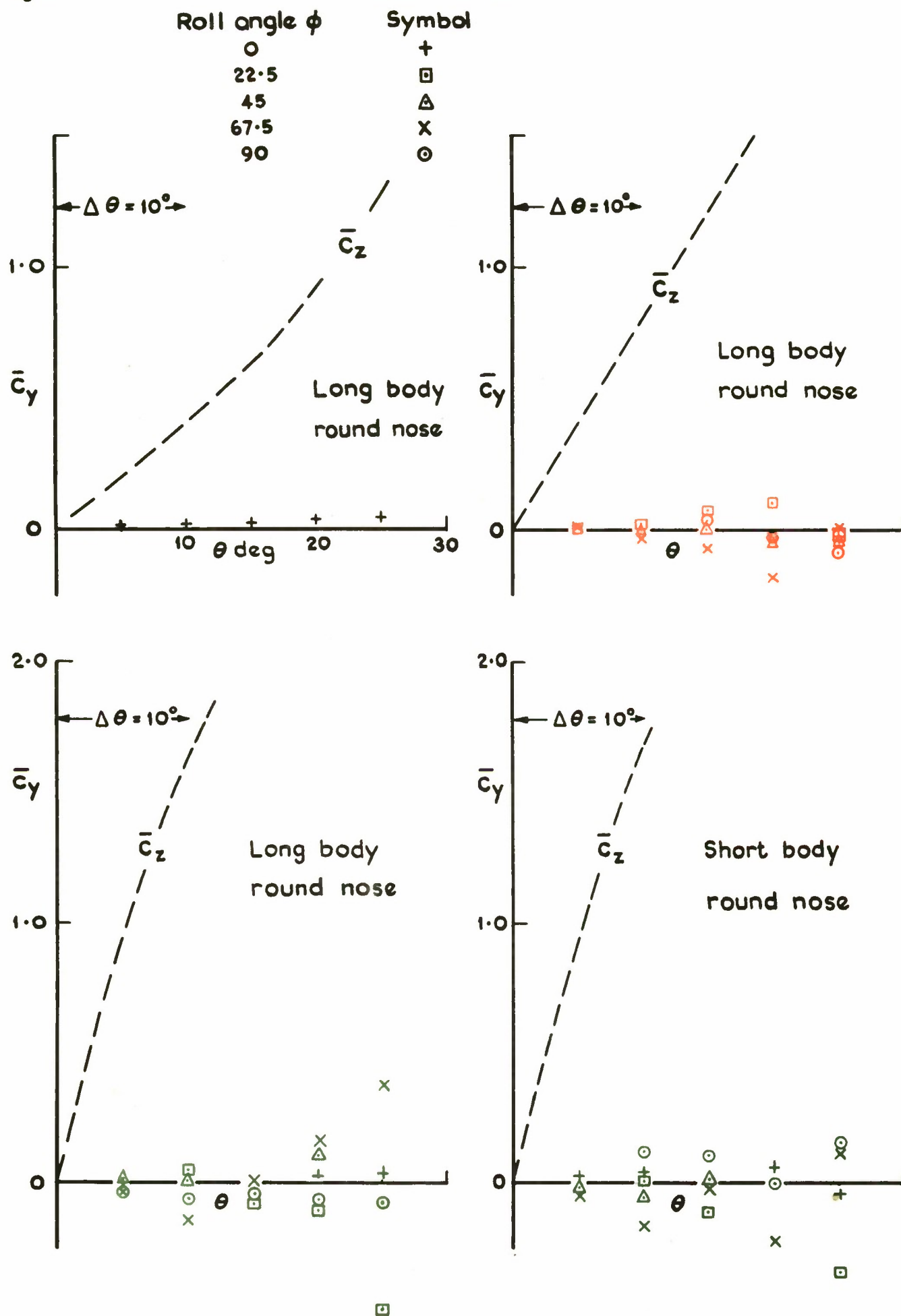
Fig.7 Variation of \bar{C}_z with θ and ϕ

Fig.8

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Fig.8 Variation of \bar{C}_y with θ and ϕ

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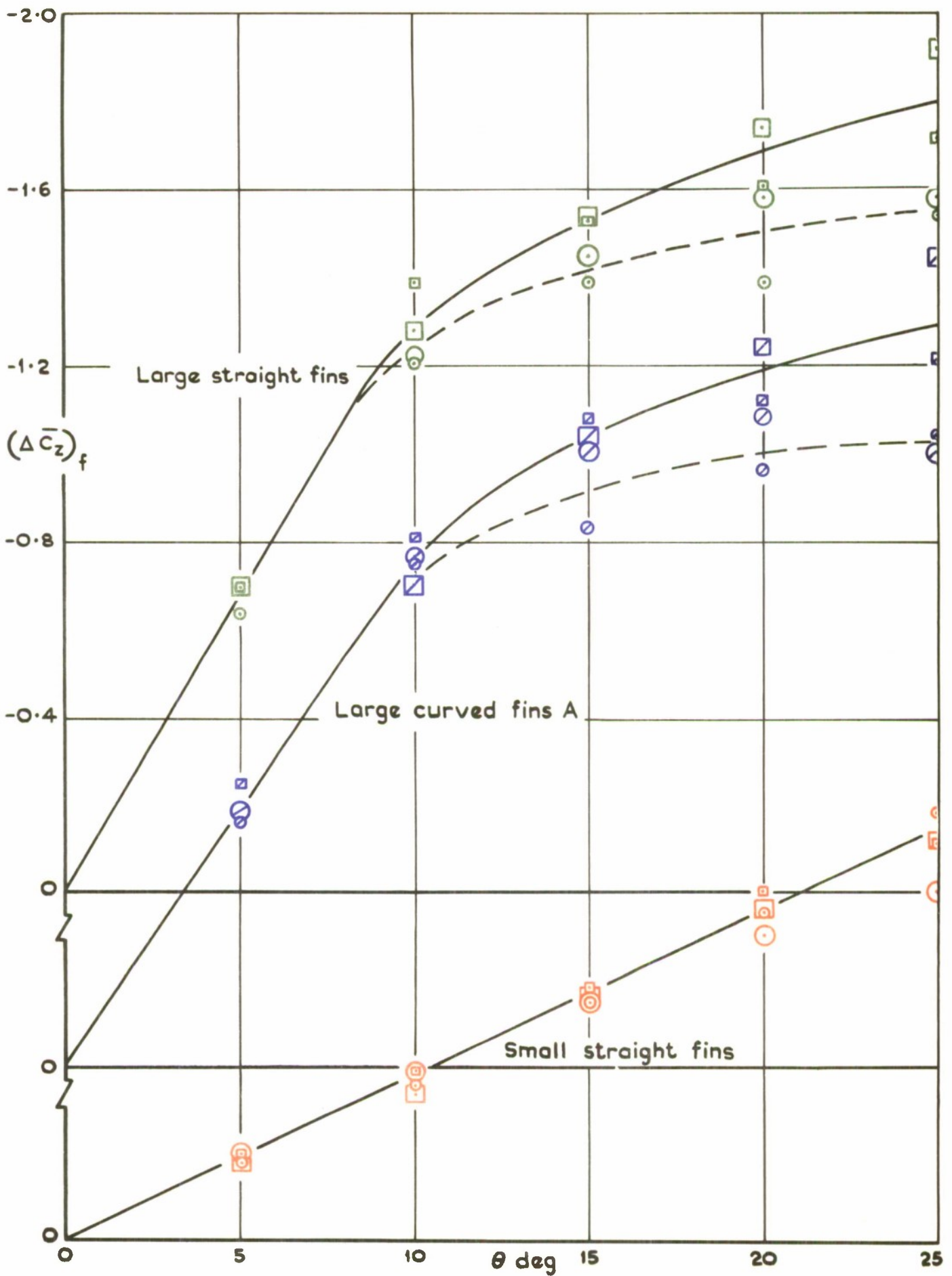
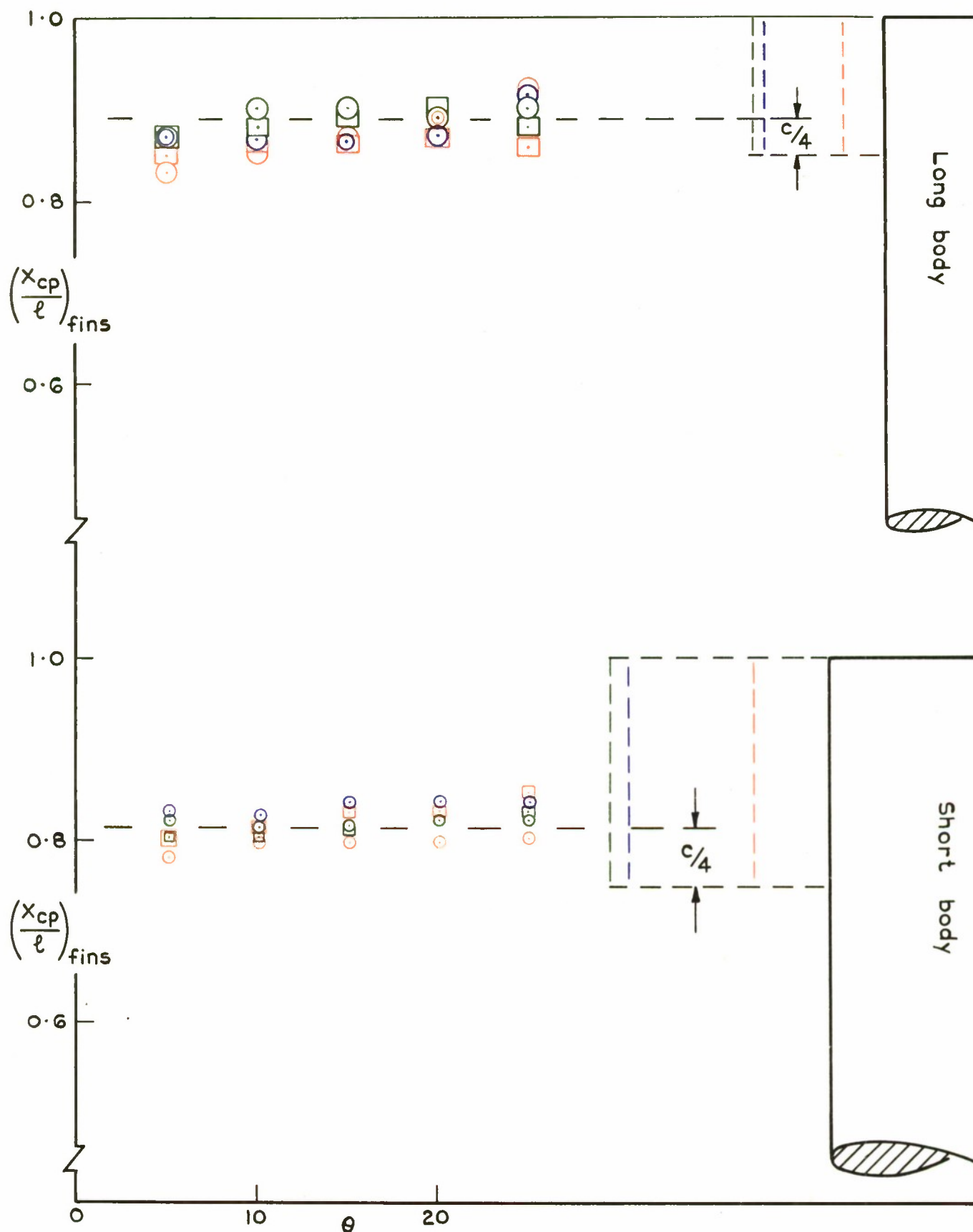


Fig.9 \bar{C}_z increment due to fins

Fig.10

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Fig.10 Variation with θ of the point of action of the force on the fins

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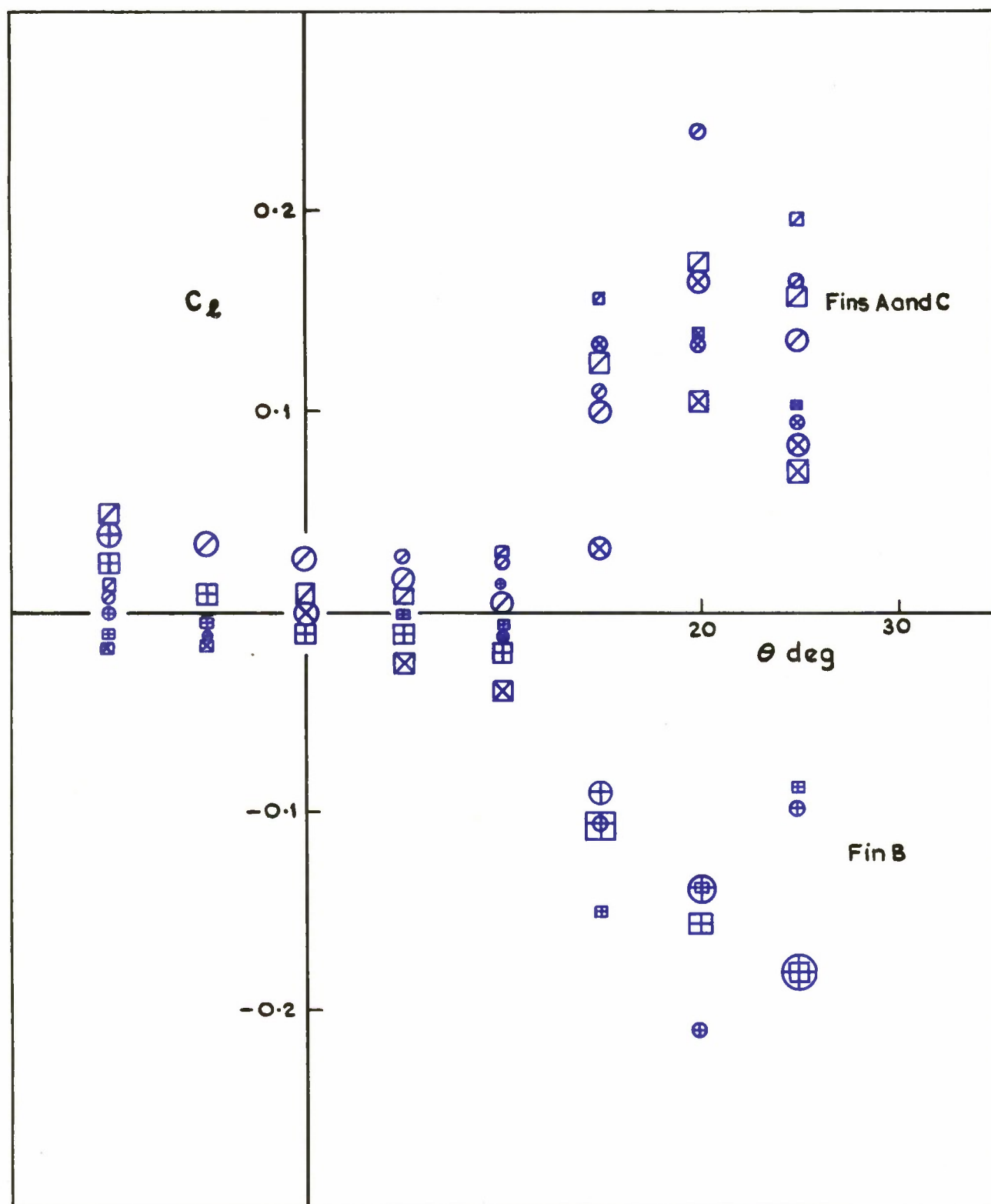
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Fig.12

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Fig.12 Rolling moment characteristics of bomblets with curved fins ($\phi = 0$)

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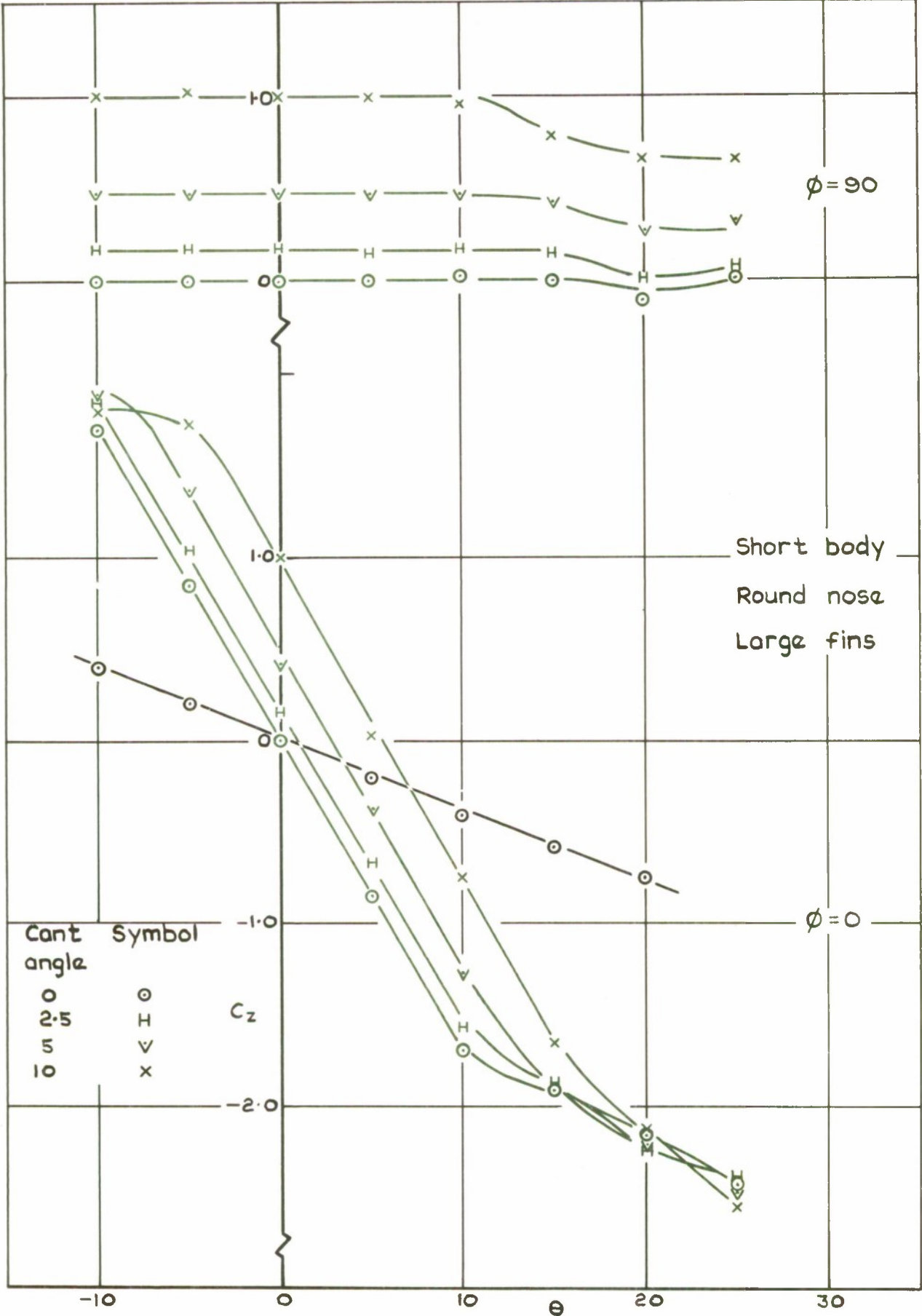
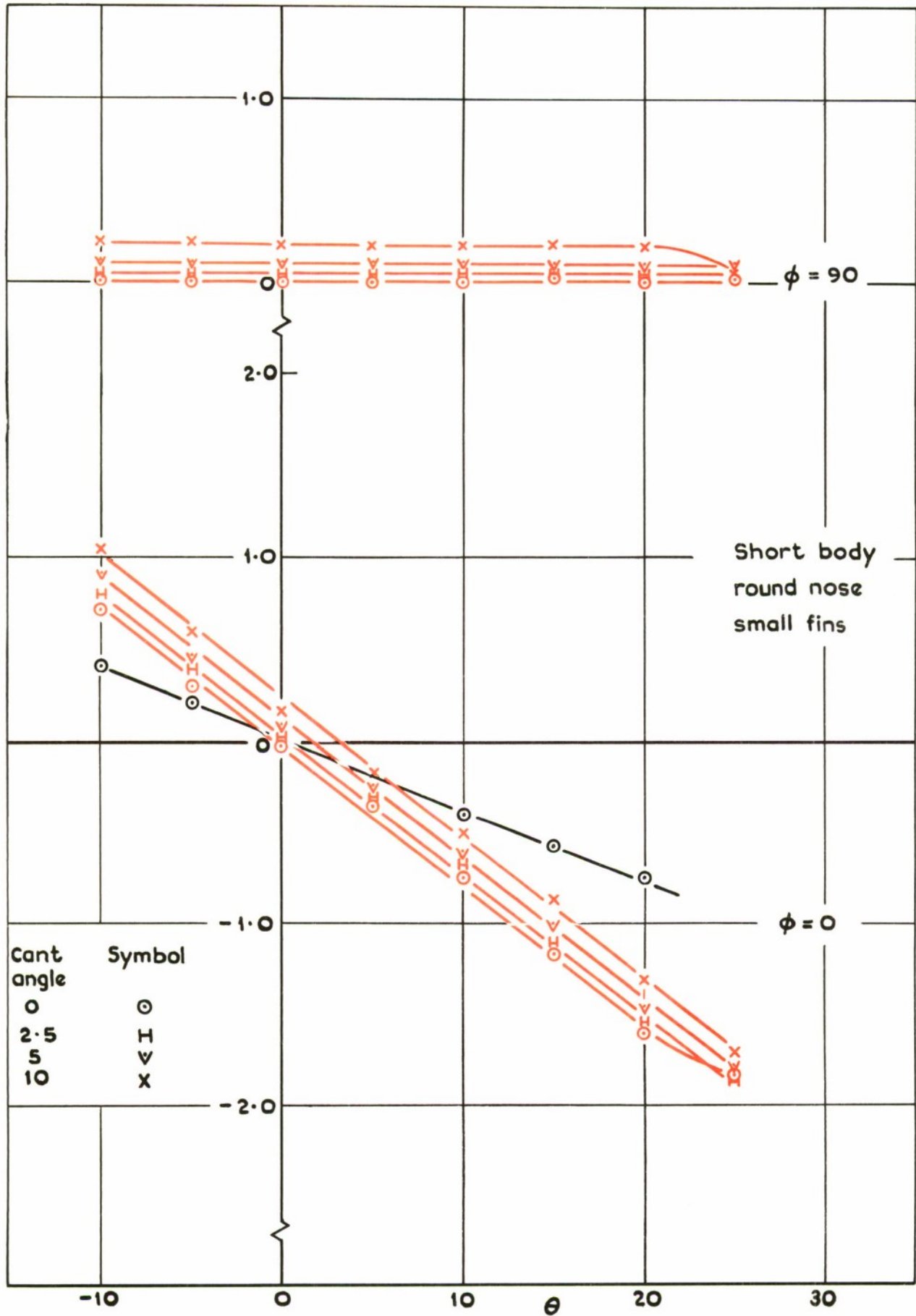


Fig.13 Variation of C_z with θ at $\phi=0$ and $\phi=90^\circ$

Fig.14

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Fig.14 Variation of C_z with θ at $\phi = 0$ and $\phi = 90^\circ$

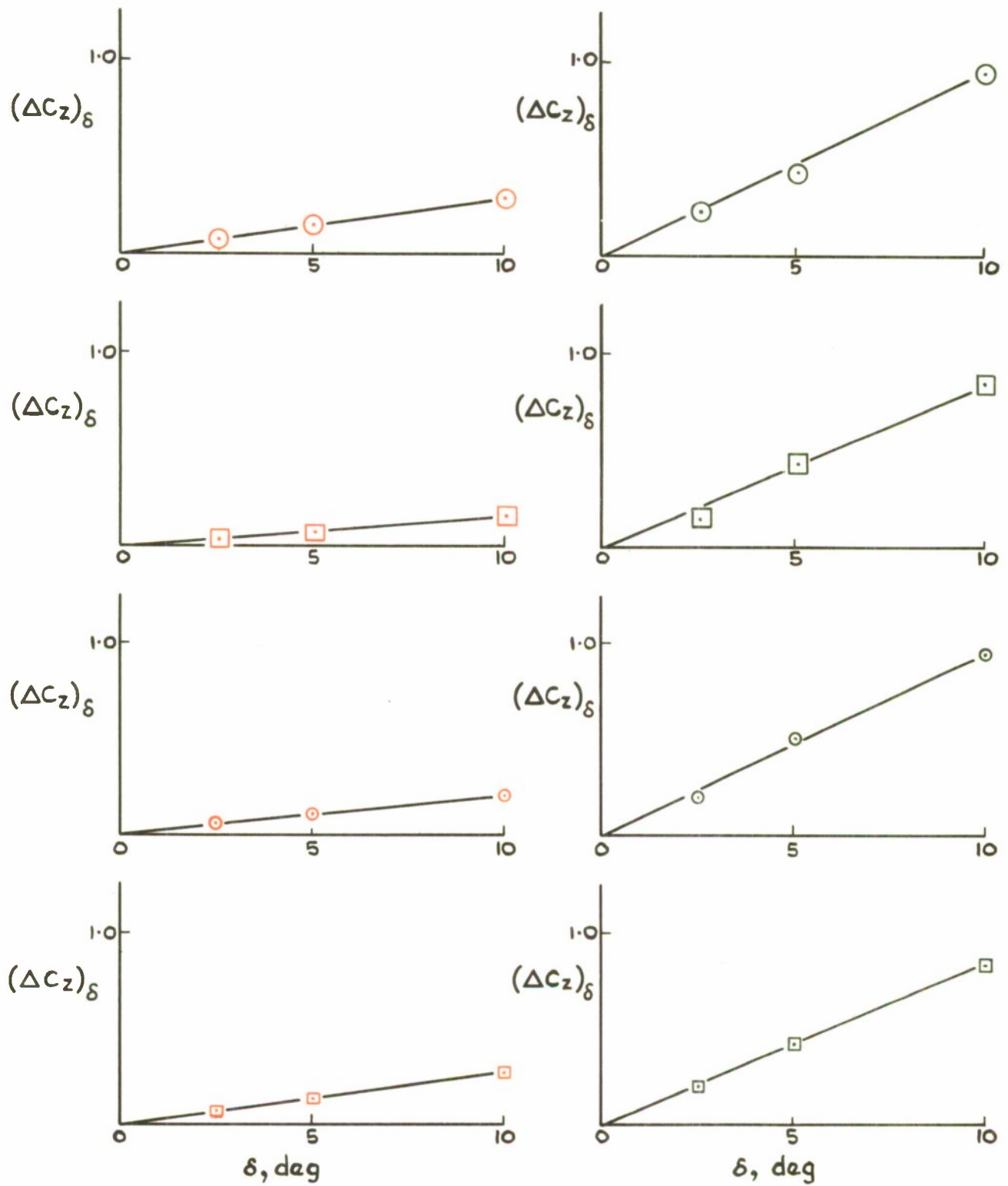
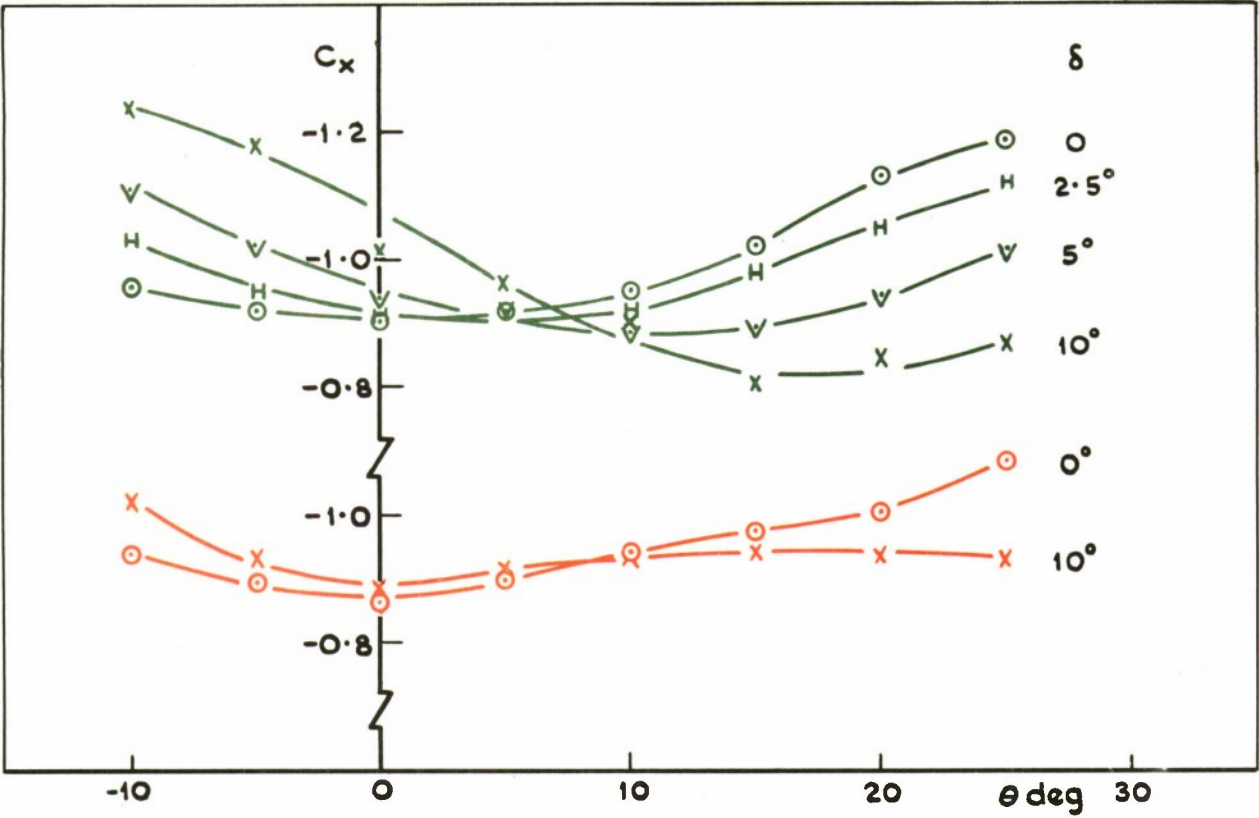
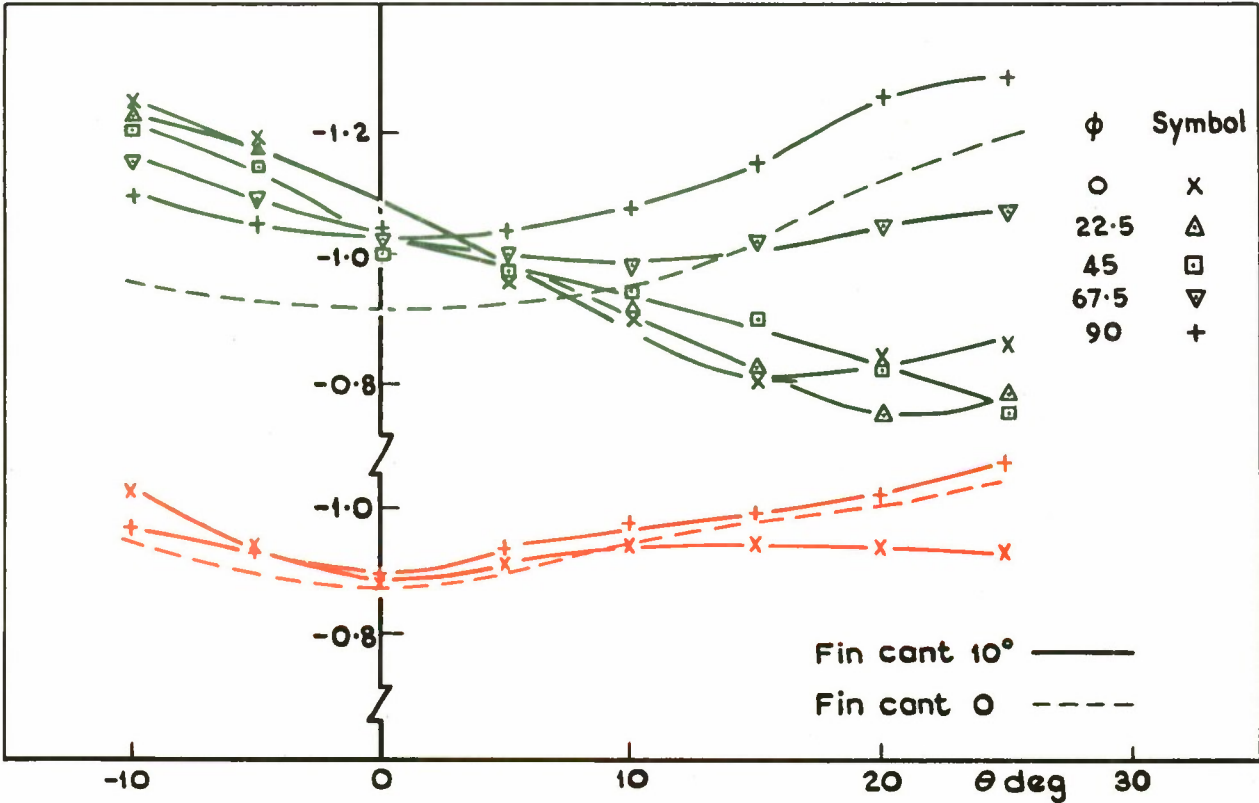
Fig.15 Variation of $(\Delta C_z)_\delta$ with cant angle ($\theta=0$)

Fig.16a&b

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a Effect of cant angle ($\phi = 0$)



b Effect of roll angle

Fig.16a&b Axial force characteristics of a short bluff-nosed bomblet with canted fins

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System of symbols

<u>Bombulet configuration</u>	<u>Symbol</u>
No fins	black
Small straight fins	red
Large straight fins	green
Curved fins	blue
Bluff noses	square
Ogival noses	round
Length/diameter ratio = 5	large
Length/diameter ratio = 3	small
Straight fins	.
Curved fins A	/
Curved fins B	+
Curved fins C	x

Bomblets with canted fins

Fins canted at zero deg	0
Fins canted at 2.5 deg	H
Fins canted at 5.0 deg	V
Fins canted at 10 deg	X

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